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Minnesota State Medical Association

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Duluth—June 30, July 1 and 2, 1947

FEBRUARY, 1947

Vol. 30 . . . No. 2

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Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 30

February, 1947

No. 2

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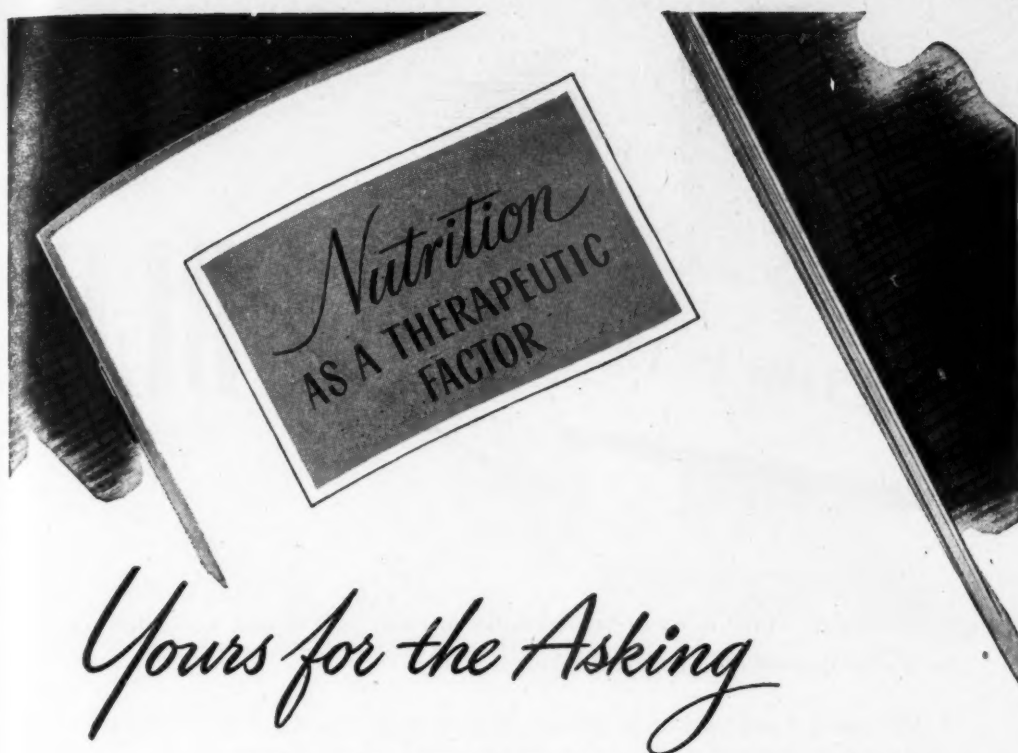
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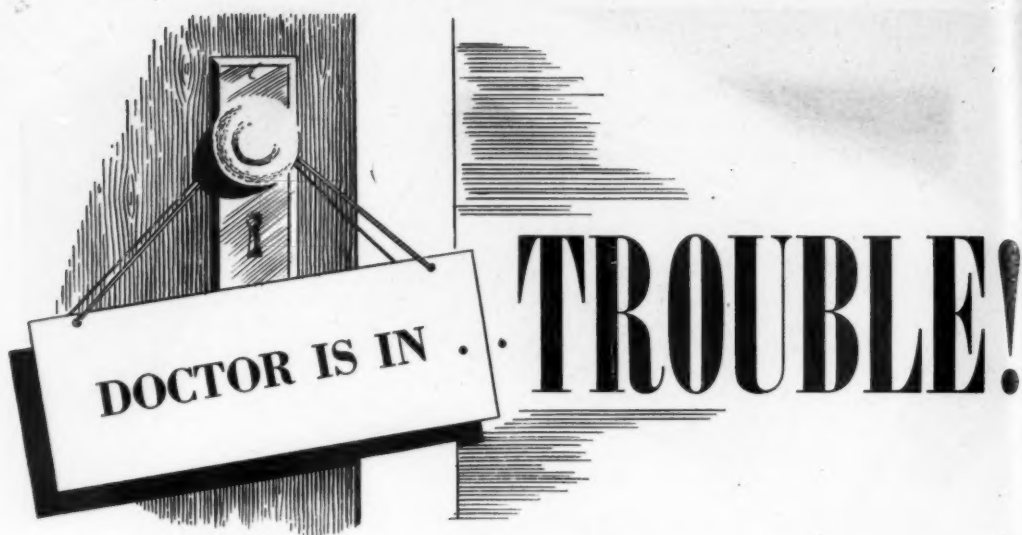
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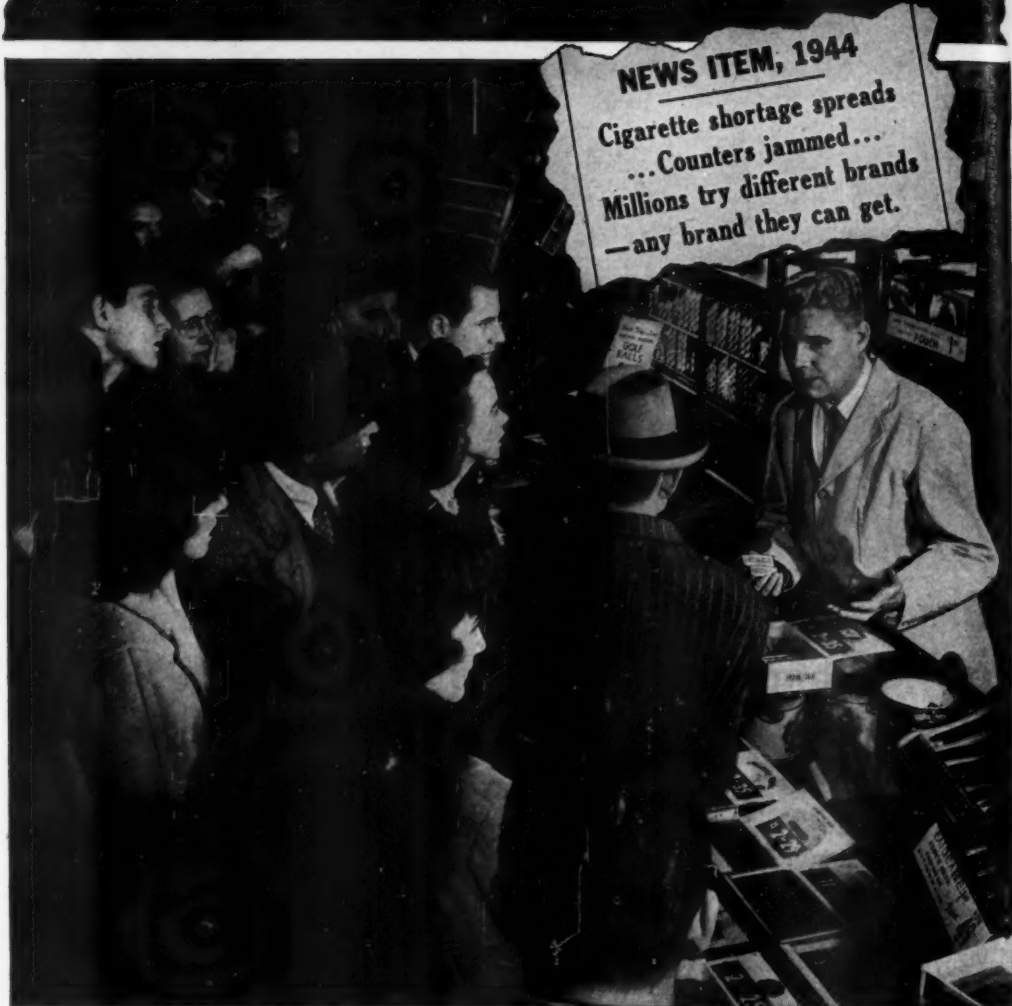
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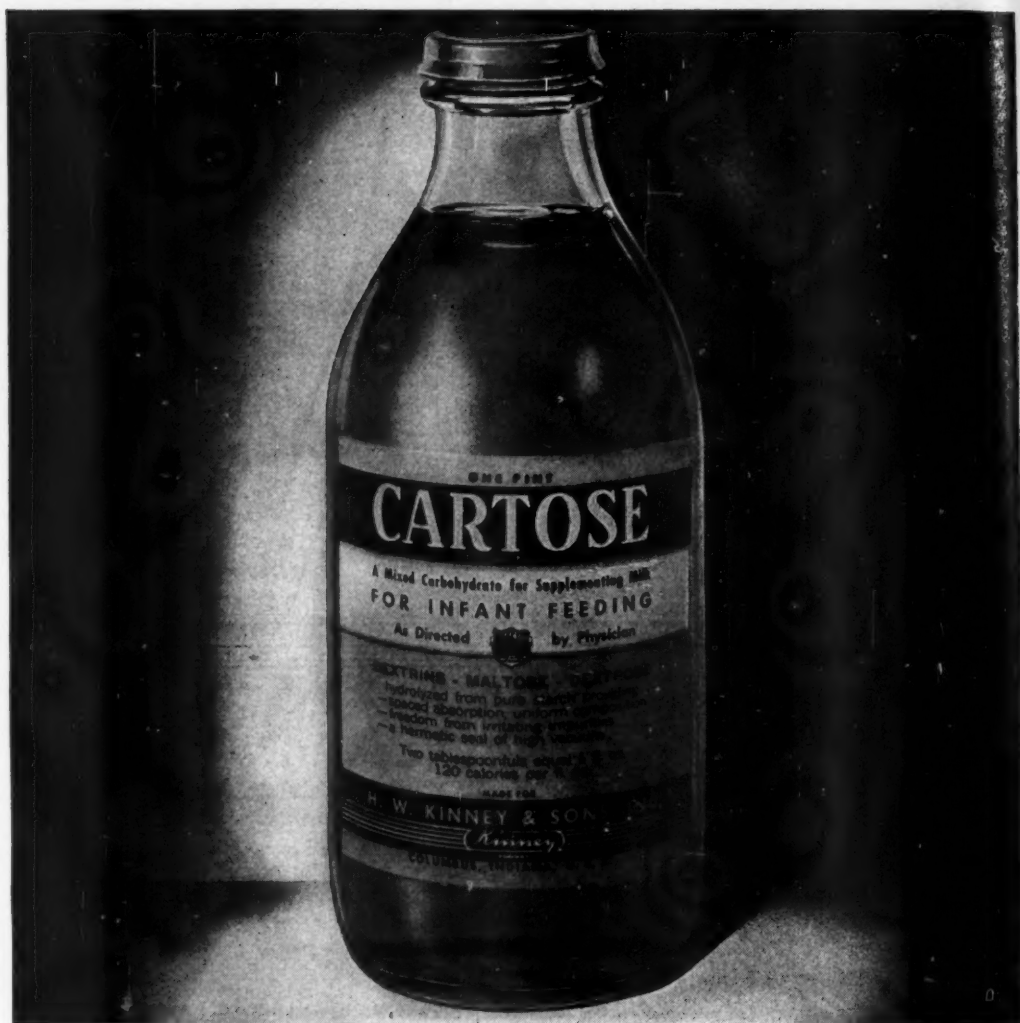
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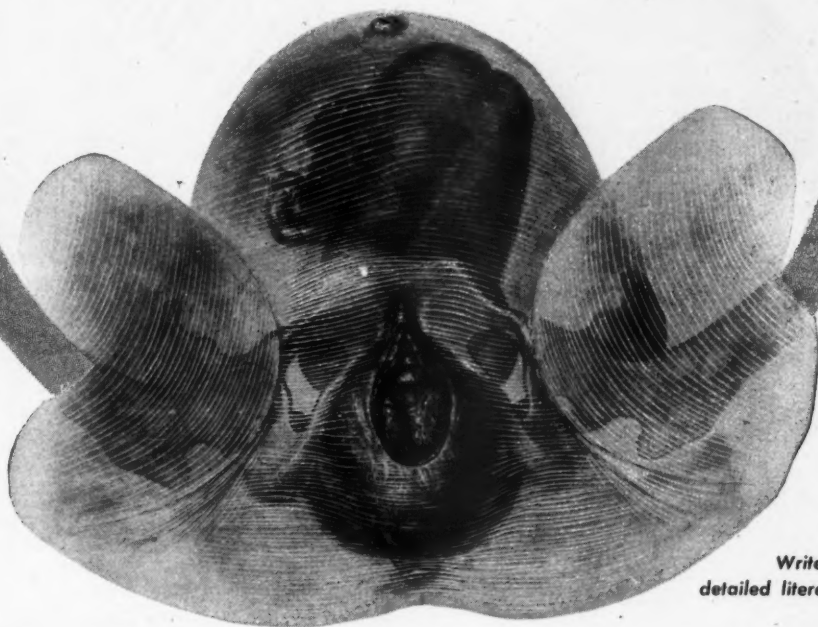
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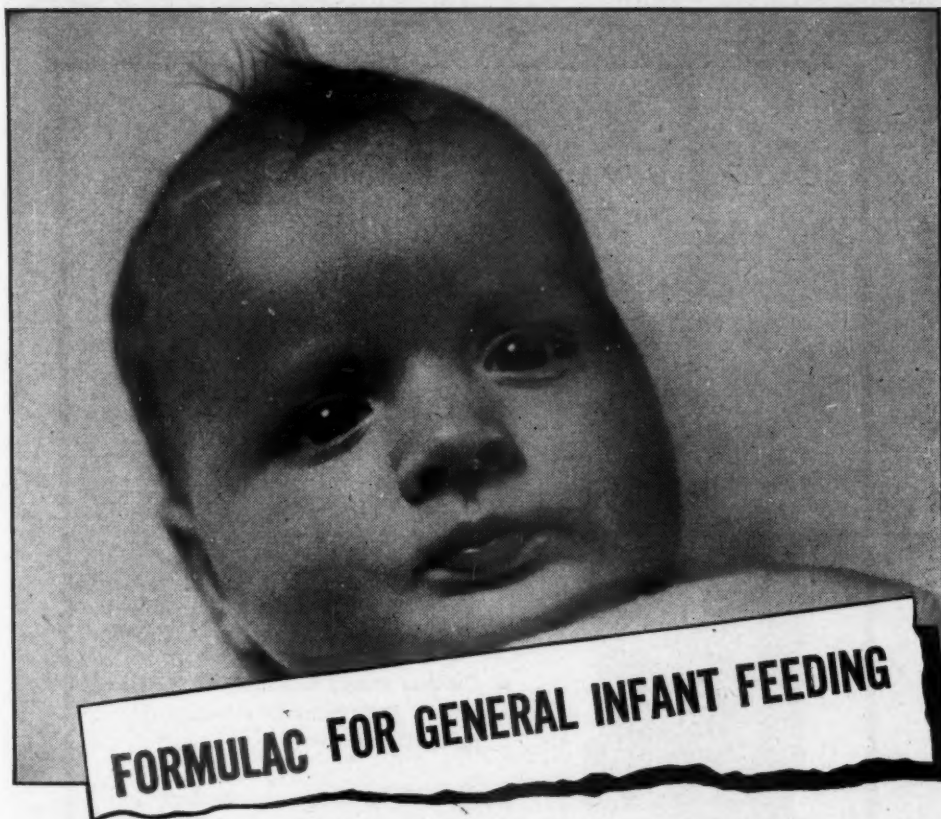
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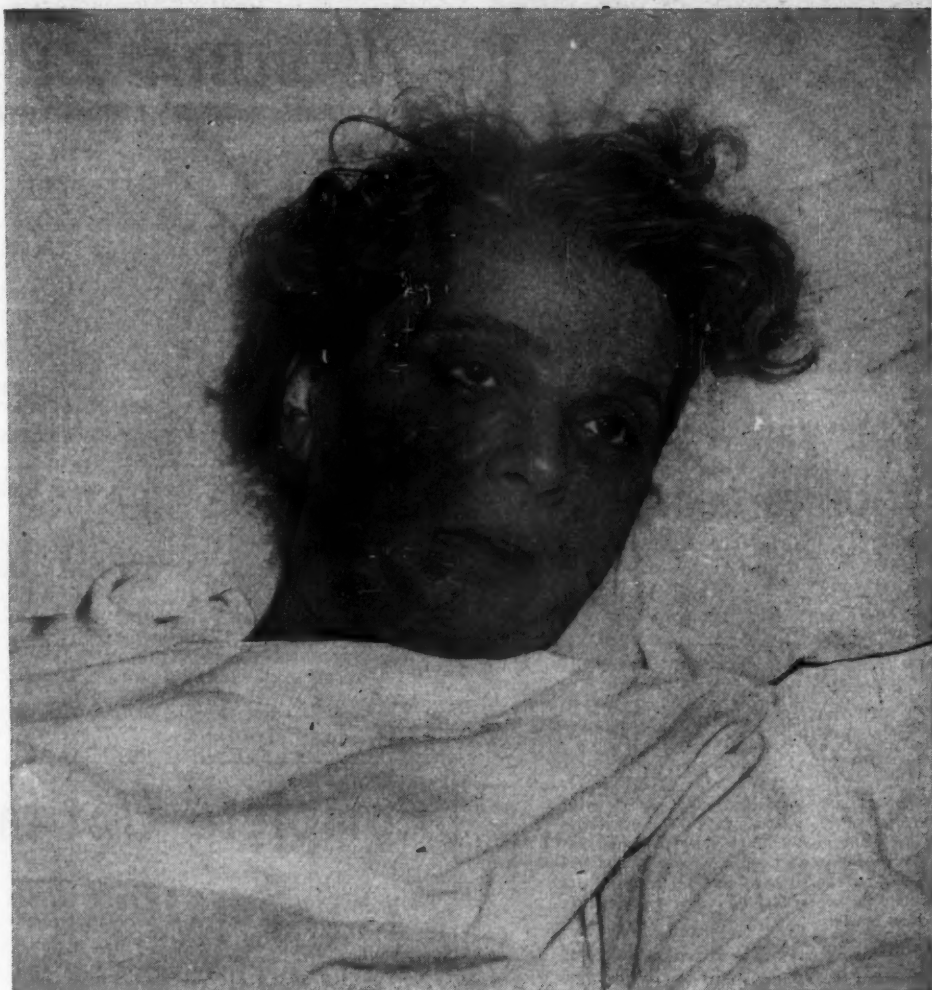
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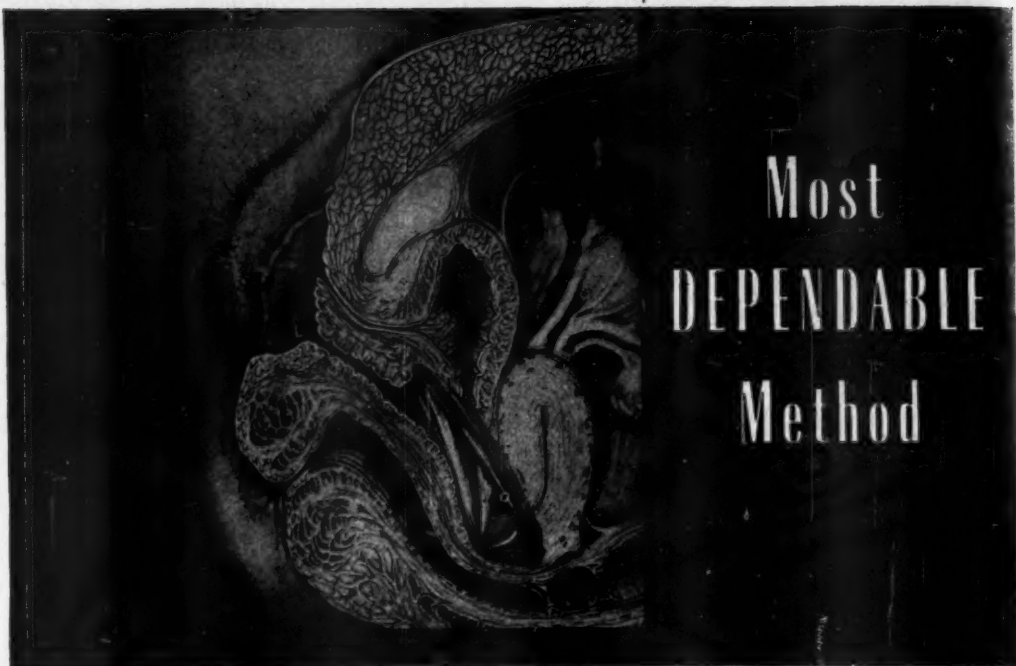
Since the maximum action of Globin Insulin usually occurs in the afternoon or early evening, hypoglycemia is sometimes noted at this time. As a guard against it, the carbohydrate content of the noon meal may be increased, or a midafternoon lunch provided. Thus the original distribution of 1/5, 2/5 and 2/5 might, for example, require adjustment to 2/10, 5/10 and 3/10 or to 2/10, 4/10, 1/10 and 3/10. Once the balance of carbohydrate intake and insulin timing has been established, the patient must be impressed with the importance of adhering to the regimen.

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1. Dickinson, R. L.: Techniques of Conception Control. Baltimore, Williams and Wilkins Co., 1942.

2. Eastman, N. J., and Scott, A. B.: Human Fertility 9:33 (June) 1944.

3. Warner, M. P.: J. A. M. A. 115:279 (July 27) 1940.

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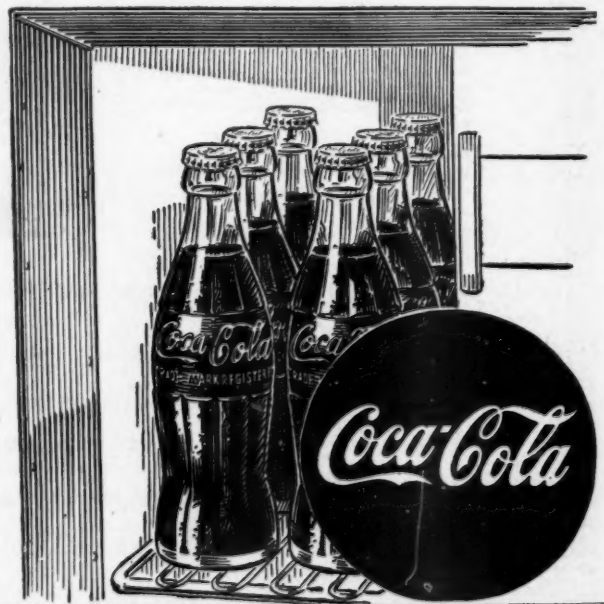
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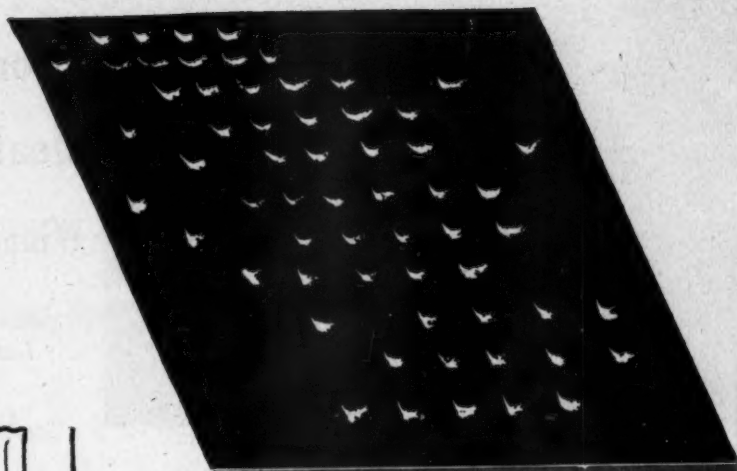


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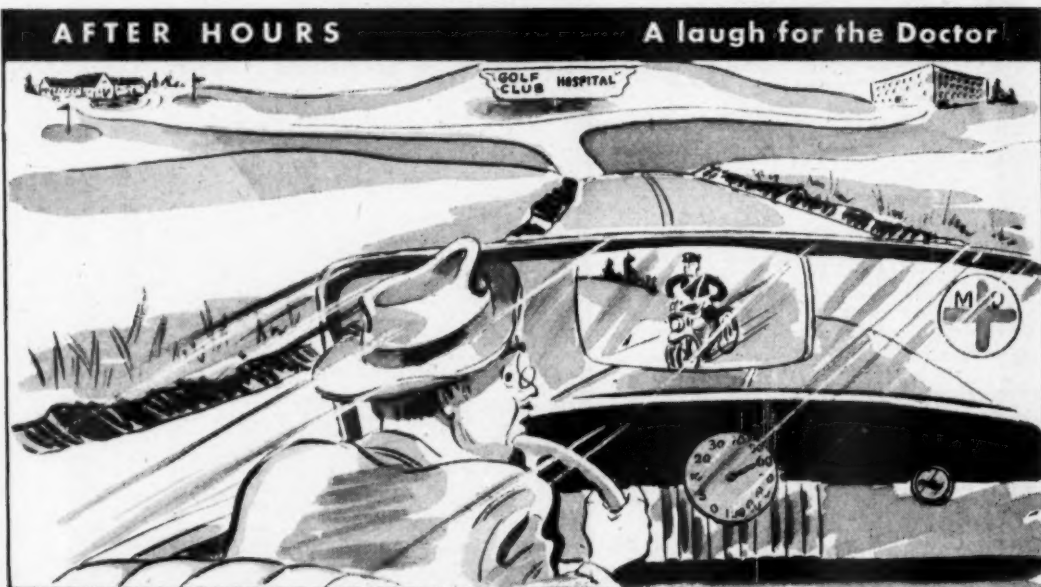
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Cawthorne, T.: The Treatment of the Common Cold, Clin. Sup. to King's College Hosp. Gaz. 19:111.

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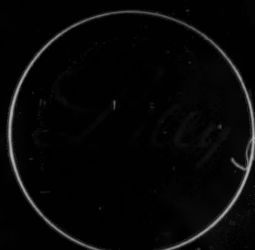
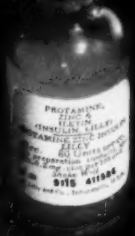
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Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 30

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No. 2

THE USE OF INSULIN MIXTURES

RANDALL G. SPRAGUE, M.D. and LAURENTIUS O. UNDERDAHL, M.D.
Rochester, Minnesota

DURING the first fifteen years following the discovery of insulin in 1921, there was a growing appreciation by physicians interested in the treatment of diabetes of the shortcomings of soluble insulin. The principal of these shortcomings are related to its brief, intense action. The results of this inefficient type of action are the necessity for multiple injections each day in the treatment of severe diabetes, the danger of insulin reactions due to precipitous falls of the blood sugar level, and the lapses of control of severe diabetes in the interval between the waning of action of one dose and the injection of the next.

With the introduction of protamine insulin in 1936, and of protamine zinc insulin shortly afterward, the possibility of modifying insulin in the direction of a more prolonged action of lesser intensity was realized. At that time it was hoped that in many of the cases in which multiple injections daily of soluble insulin had been required, the diabetes would remain under satisfactory control with a single injection daily of protamine zinc insulin. Unfortunately, in many cases this hope has not been realized, for reasons which now seem obvious. Protamine zinc insulin does not have sufficient intensity of action to prevent excessive glycosuria following the ingestion of food in cases of severe diabetes, while its continuing action during the fasting hours of the night may result in hypoglycemic reactions while the patient is asleep. Among all the cases in which diabetes is severe enough to require insulin, only the relatively mild

ones (usually those requiring 20 units or less daily) are satisfactorily regulated with a single dose of protamine zinc insulin alone with assurance that nocturnal reactions will be avoided.

Thus, it soon became apparent that some compromise between the short, intense action of soluble insulin and the prolonged, weak action of protamine zinc insulin would have greater therapeutic usefulness than either of these two insulins alone. Treatment with both types of insulin injected separately has been widely employed as a means of achieving this compromise, but this method is objectionable because multiple injections are required. Lawrence¹ of London was the first to suggest treating diabetes with a single daily injection of soluble and protamine zinc insulin mixed in one syringe. Following his suggestion, the Section on Metabolism Therapy of the Mayo Clinic has been using such mixtures since 1938 in the treatment of many diabetic patients. Day-by-day clinical observation and controlled clinical investigation by ourselves and others have taught us much about the mode of action and the clinical applicability of such mixtures. The most important single lesson that has been learned from observation of patients is that mixtures containing two or three times as much soluble insulin as protamine zinc insulin are the most suitable for the treatment of diabetes which is severe enough to require the use of mixtures. This observation is corroborated by several experimental studies, notably those of Colwell and his colleagues.² The latter investigators showed that definite intermediate effects, in terms of promptness, intensity and duration, are not obtained un-

From the Division of Medicine, Mayo Clinic, Rochester, Minnesota.

Read at the meeting of the Northern Minnesota Medical Association, Crookston, Minnesota, August 24, 1946.

til the mixture contains at least as much soluble insulin as protamine zinc insulin. By increasing the proportion of soluble insulin further, any desired effect intermediate between those of the two kinds of insulin alone can be obtained.

Colwell¹ showed further that when excess soluble insulin is added to protamine zinc insulin in ratios as high as 4:1, virtually no soluble insulin remains in the supernatant, and the mixture has a monophasic action on injection. In simple terms, this means that protamine has a tremendous capacity to combine with insulin, with the result that the insulin in the commonly employed mixtures is in a single complex rather than two (rapid-acting and slow-acting) compounds. Thus, it is not technically correct to speak of the quick action of the regular insulin and the slow action of the protamine zinc insulin in a mixture. The mixture is in reality a single compound which is different from either of the component types of insulin in that the protamine is more saturated with insulin than it is in commercial protamine zinc insulin. The result of such saturation of protamine is that insulin is released at a more rapid rate than from standard protamine zinc insulin.

Aims of Treatment

Let us digress for a moment to consider the aims of treatment of diabetes with particular reference to the physiologic problem involved in the use of insulin in the treatment of diabetes. The aim of treatment can be simply stated as being the maintenance of health and vigor for a normal span of life. This implies avoidance of acute complications, such as insulin reactions and ketosis, as well as the chronic degenerative complications of the disease, such as retinopathy, neuropathy and intercapillary glomerulosclerosis. At the present time it seems that the treatment which is most likely to achieve the desired end is that which maintains optimal nutrition and reduces the excretion of glucose in the urine to the lowest possible level consistent with a livable program and the avoidance of insulin reactions. Precise control of the level of the blood sugar, which in some cases can be achieved only by frequent injections of insulin and bizarre adjustments of the diet, and in other cases cannot be achieved at all, probably offers no additional advantage. Evidence is accumulating that even the most precise control of diabetes will not always prevent the development of degenerative complications.

The theoretical aim in administering insulin to the patient who has diabetes is to supplement his own endogenous production of insulin in such a way as to imitate as closely as possible the secretion of insulin by the normal pancreas. While there is much that is not understood about the regulation of insulin secretion, a reasonable physiologic hypothesis provides useful guidance in the administration of insulin to patients. Indirect evidence suggests that there are two types of secretion: (1) a continuous slow secretion during fasting, which serves to prevent excessive catabolism of body protein and fat and to maintain the blood sugar at a normal level against the various factors which tend to elevate it, and (2) an augmented secretion following the ingestion of food, which in most persons prevents the excretion of more than small amounts of glucose in the urine. An exact imitation of these mechanisms is impossible to attain, but by skillful employment of quick and slow acting insulins the physician is usually able to achieve a reasonably satisfactory approximation of the normal processes. Obviously, in the treatment of severe diabetes in which most, if not all, of the body's requirement for insulin must be injected, the normal mechanisms of insulin secretion will be better imitated by a type of insulin which provides both rapid and slow actions than they would be by an insulin which provides only one of these.

The principal indication, then, for the use of mixtures of protamine zinc insulin and regular insulin is diabetes of such severity that glycosuria is not adequately controlled and insulin reactions are not avoided by the use of a single morning dose of protamine zinc insulin of moderate size. It would be extravagant to claim that such mixtures solve all the therapeutic problems of severe diabetes, for there still remains a small group of cases in which insulin reactions and poor control of glycosuria continue to be major problems.

Clinical Use of Mixtures

The use of extemporaneous rather than fixed mixtures of the two types of insulin provides necessary flexibility of quick and slow action.* The

*The use of extemporaneous mixtures of protamine zinc insulin and soluble insulin in one syringe calls for precautions to prevent the introduction of one kind of insulin into the other bottle. An appropriate volume of air is first injected into the bottle of protamine zinc insulin and the needle is withdrawn without permitting any insulin to enter the syringe. Then the desired dose of soluble insulin is drawn into the syringe in the usual manner. After this the needle is again inserted into the bottle of protamine zinc insulin and the desired dose is allowed to flow into the syringe, overlying the soluble insulin which is already there. The two kinds of insulin are mixed by drawing a small bubble of air into the syringe, inverting the syringe several times and then expelling the bubble.

combined dose is administered in one syringe in the morning before breakfast. As previously stated, mixtures containing two to three times as much soluble insulin as protamine zinc insulin have proved to be the most effective in the treatment of severe diabetes. Of 100 patients who were recently treated with mixtures, the ratio of soluble to protamine zinc insulin was from 2:1 to 3:1, inclusive, in eighty-seven (Table I). The more severe the diabetes, or the higher the carbohydrate content of the diet, the more likely is the ratio to be in the neighborhood of 3:1 rather than 2:1. The strong effects of the mixture prevent excessive glycosuria during the day when food is being ingested, and the prolonged slow effects prevent escape from control overnight.

TABLE I. MIXTURES OF SOLUBLE AND PROTAMINE ZINC INSULIN IN 100 CASES OF DIABETES MELLITUS

Ratio of soluble to protamine zinc insulin	Cases
1:1 to 1.5:1	5
1.5 +:1 to 2 -:1	5
2:1 to 2.5:1	62
2.5 +:1 to 3:1	25
3 +:1 to 3.5:1	2
3.5 +:1 to 4:1	1

As pointed out by Colwell,¹ problems of insulin therapy would be simplified by the marketing of a modified insulin having an action like that of a 2:1 mixture of soluble and protamine zinc insulin, in place of the commercial protamine zinc insulin which is now available. Such an insulin would obviate the need for extemporaneous modification in many cases, as it would fill the needs of all the patients who are now successfully treated with protamine zinc insulin alone, as well as of the majority of the patients who are now treated with mixtures. In the few cases in which higher ratios of soluble to protamine zinc insulin are required, supplementation with additional soluble insulin could be readily accomplished in accordance with the needs of the individual patient.

Patients whose diabetes is eventually found to be controllable with mixtures in which the ratio of soluble to protamine zinc insulin is 1:1 or less, usually have relatively mild diabetes, which fares equally well with a single small morning dose of protamine zinc insulin. The use of various kinds of insulin in diabetes of different degrees of severity has been discussed by Wilder⁵ and by Sprague.⁴

Adjustment of the Dose

The size of the initial mixed dose in new cases depends on clinical judgment and an estimate of the fundamental severity of the diabetes. For example, if the patient is an adult whose diabetes is anticipated to be basically mild, even though the patient may present himself with fairly intense glycosuria, the starting dose may be of the order of 6 units of protamine zinc insulin and 12 units of soluble insulin. If the diabetes is of greater severity, as is the rule among children, adolescents and young adults, the dose may be of the order of 12 units of protamine zinc insulin and 24 units or more of soluble insulin. Rarely need the total initial dose exceed 60 units. Small children can be expected to respond to smaller doses than young adults. In the absence of ketonuria, caution should be exercised in increasing the dose during the first few days of treatment, for the full effects of the starting dose may not be apparent for several days.

Whatever the initial dose of insulin, subsequent adjustments are made on the basis of frequent tests of the urine for sugar. Until a satisfactory balance is established, the urine is tested four times daily. Once reasonable control has been achieved, further adjustment of the doses of the two kinds of insulin can be made on the basis of two daily tests: (1) The test of a fresh specimen voided in the morning before breakfast is a satisfactory criterion of the adequacy of the dose of protamine zinc insulin. The dose is adjusted so that there will be no nocturnal insulin reactions and no more than traces of sugar in the morning specimen. (2) The test of a fresh specimen voided late in the afternoon before supper serves as an index of the adequacy of the dose of soluble insulin. The aim is to adjust this dose so that there will be few or no insulin reactions during the day and no more than traces of sugar in this specimen.

When it is necessary to increase or decrease the dose of insulin, the magnitude of the change should depend on several factors. As a rule, the larger the dose, the larger the change should be. Since most mixed doses will contain approximately twice as much soluble insulin as protamine zinc insulin, the magnitude of change of the two kinds of insulin is kept in about the same proportion.

[†]Only if the urine has been recently secreted by the kidneys will the urine tests provide accurate information about the state of the diabetes at the time when the test is made. To this end, the patient is instructed to empty the bladder about thirty minutes before collecting the specimen for testing.

For example, the soluble insulin may be changed 4 units at a time, and the protamine zinc insulin 2 units at a time. Very large doses of soluble insulin may be raised or lowered 6 or 8 or more units at a time. Some small children, and a few adults, are so sensitive to small changes that alterations in steps of more than 2 units may be inadvisable.

Any rules for adjustment of doses must be modified to suit the vagaries of the individual case. In some cases of severe diabetes, for example, once preliminary regulation has been completed and tolerance has become stabilized, it may be wise not to alter the doses of the two kinds of insulin in spite of occasional intense glycosuria or mild insulin reactions, since such transient fluctuations may be due to factors other than insulin. Among these factors are emotional disturbances, irregularities of rate of absorption of insulin from different sites of injection, and variations of food intake and physical activity. A sound principle in such cases is to find a dose of insulin which provides adequate control on most days and adhere to it until there is good reason to make a change.

Most physicians have had experience with cases of severe diabetes in which glycosuria is not satisfactorily controlled and insulin reactions are not avoided throughout the twenty-four hours by the use of a single mixed dose of protamine zinc insulin and soluble insulin. Control in such cases is sometimes improved by the addition of a small dose of soluble insulin before supper. Usually this dose need not exceed 10 or 12 units. Adjustments of dose are then made chiefly in the soluble insulin taken in the morning and evening, for the dose of protamine zinc insulin can usually be kept small and requires little or no alteration. The afternoon test of the urine, and insulin reactions occurring during the day, are the guides for adjustment of the morning dose of soluble insulin. The evening dose of soluble insulin is ad-

justed on the basis of the morning test of the urine and nocturnal reactions.

Summary

Mixtures of protamine zinc insulin and soluble insulin in proper proportions provide both quick, intense action and slow, prolonged action. They are more effective than either of the two component insulins alone in most cases of moderately severe to severe diabetes. A proper proportion in most instances is between 2 and 3 units of soluble insulin to 1 unit of protamine zinc insulin.

Such mixtures attain their greatest effectiveness in those cases of moderately severe diabetes which have long been recognized as being reasonably easy to treat by a variety of therapeutic programs involving multiple doses of soluble insulin. They do not solve all the problems of insulin therapy in patients who have severe, "brittle" diabetes of the type which has always been difficult to control with any program of treatment.

Extemporaneous mixtures have the advantage of flexibility, which makes them adaptable to a variety of cases. Such flexibility is desirable as it has not been possible thus far to produce any single modification of insulin which will fill the needs of all cases of diabetes. However, a modified insulin having an action like that of a 2:1 mixture of soluble and protamine zinc insulin could be used without modification in many more cases than the standard protamine zinc insulin which is now available. It could be further modified by the extemporaneous addition of more soluble insulin when necessary.

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ATOMIC ENERGY—ITS MEDICAL APPLICATION

A problem of extraordinary importance is before the Council on Physical Medicine and the Council on Industrial Health of the American Medical Association, namely, atomic energy and its medical applications.

At a joint meeting of the two Councils, specialists on roentgen rays, radium and atomic energy discussed a long-range program for considering the products, the

problems and the means of disseminating information.

The Council on Industrial Health decided to sponsor articles on the dangers associated with the manufacture of radioactive material. The Council on Physical Medicine voted to prepare articles for publication in *The Journal of the American Medical Association* on the therapeutic and diagnostic uses of radioactive isotopes.

MINNESOTA MEDICINE

THE PRESENT SOUTHERN MINNESOTA MEDICAL ASSOCIATION

Its Antecedents, Purposes and Character

CARLE B. McKAIG, M.D.

Pine Island, Minnesota

IT is said that excessive preoccupation with the past is an indication of senility and, no doubt, this is true. Age dreams of the past while youth anticipates the future with eagerness. However, I believe that a reasonable pride in our history and tradition is commendable, and our organization has a history of which we may well be proud.

The older members of the association are familiar with its history. There are, however, those who have become members since the history was last reviewed. This was in 1935, when Dr. M. C. Piper presented an excellent historical sketch. It is for the newer members particularly that I present this review.

The present Southern Minnesota Medical Association was formed August 3, 1911, at Rochester. It was brought into being by merger of the Minnesota Valley Medical Association and the old Southern Minnesota Medical Association. The organization thus formed was given the name of the latter component association.

The Minnesota Valley Medical Association

The Minnesota Valley Medical Association, the older of the two components, was organized December 1, 1880, at Le Sueur Center. A preliminary meeting had been held the previous October in Le Sueur Center.

It is said that the plan for the organization originated with the physicians of Mankato. However, Dr. Otis Ayer, of Le Sueur Center, took the initiative to the extent of writing to a number of physicians, requesting their presence at the organizational meeting. The original plan specified that there were to be two meetings a year, one of which always was to be held in Mankato.

This organizational meeting was held sixty-six years ago. To correlate it with national events, let me point out that this was only fifteen years after the close of the Civil War. President Garfield was in office. The great Indian War of the Northwest was just over, and the country was still mourning those who had died at the Battle of the

Little Big Horn, in 1876, just four years before. To correlate the organizational meeting with contemporary medical history, 1880 was the year in which Lord Lister introduced the use of catgut in surgery of the vascular system. Only thirteen years had passed since he had published his revolutionary paper, "On the Antiseptic Principle in the Practice of Surgery," which marked the beginning of modern surgery.

Medical education in the United States was in a chaotic state and momentous changes were taking place in medical knowledge and practice. The earnest men who formed the Minnesota Valley Medical Association truly appreciated the vital need for an organization which would further medical knowledge.

Transportation was an important factor and was necessarily by railroad. Hence, it was planned that the membership of the Minnesota Valley Medical Association be drawn, in a general way, from those communities which lay along the "Omaha Road," as one portion of the Chicago and Northwestern Railroad was called in those days. There were thirteen charter members but, by 1883, the members numbered forty-five. Dr. Otis Ayer was elected the first president. He had been surgeon to the Second Minnesota Regiment of Volunteers and he became president of the Minnesota State Medical Association in 1877. He died in 1889.

Dr. C. F. Merritt, of St. Pefer, was first treasurer and continued to hold this office through the entire existence of the association, and also after its merger with the Southern Minnesota Medical Association, until his death in 1921.

At the time of the merger, in 1911, Dr. E. J. Davis, of Minnehaha, presented a brief historical sketch of the Minnesota Valley Medical Association. He recalled that the original programs had consisted entirely of reports of cases. Each member in turn described cases he had encountered in his practice since the last meeting and the entire membership then discussed each case. Later, the meetings came to assume a more formal character, with prepared papers and open discussion following.

Presidential Address, Southern Minnesota Medical Association, delivered at Faribault, Minnesota, September 9, 1946.

PRESENT SOUTHERN MINNESOTA MEDICAL ASSOCIATION

In the same sketch, Dr. Davis also pointed out that inasmuch as money was very scarce and hard to obtain in those days, no avoidable expense was incurred by the association. In this matter, the interests of the young physician were being considered particularly, as it was thought that he needed the association most and he had the least money to pay for its maintenance. It was thought that everything should be done to encourage his attendance. There were no banquets for this reason. The annual dues were 50 cents, with an extra assessment of 50 cents whenever the treasury was empty.

In 1880, wheat sold for 87 cents per bushel, but beef brought \$3.66 per hundred weight, and pork \$5.10 per hundred weight. This was the economic background against which the Minnesota Valley Medical Association was founded.

Members of the association were all pioneers; many were former army surgeons, and some had been Indian fighters. Their origins were largely in the East. Some were Europeans. They were truly representative of the original stock of the State of Minnesota. The association was the first district medical organization in the state.

The Old Southern Minnesota Medical Association

The second of the two original component societies, the Southern Minnesota Medical Association, was formed in Winona on July 26, 1892. Agitation for formation of this organization apparently had existed for a long time. For instance, Mrs. N. H. Guthrie, of the Mayo Clinic, while engaged in research on the history of medicine in Minnesota, discovered an item in the *Rochester City Post* for January 16, 1869. Therein it was reported that a communication had been received by the Olmsted County Medical Society, from Dr. Youmans, of Winona, advocating that the Olmsted County Medical Society, which had been formed only the previous year, be enlarged to include all Southern Minnesota.

At the first meeting of this old Southern Minnesota Medical Association, a program of five papers was presented. It was as follows:

Cerebrospinal meningitis—Dr. McGAUGHEY, Winona

Less common forms of surgical tuberculosis—Dr. W. J. MAYO, Rochester

Endometritis—Dr. W. T. ADAMS, Elgin

Hypertrophic rhinitis—Dr. H. H. WITHERSTINE, Rochester

Consideration of the knee jerk symptoms—Dr. R. M. PHELPS, Rochester

The meetings rotated among Winona, Rochester and Owatonna, and were held annually.

One of the duties of the secretary was to canvass the members for papers to be presented at the annual meeting. Apparently the response was good because the papers presented were, for the most part, by the members themselves. I think our present membership might take a lesson from this and give a better response to the request of the program committee for papers. It is becoming increasingly difficult for the committee to obtain papers from the members. During the entire eighteen years of the existence of the old Southern Minnesota Medical Association, there were only two secretaries: Dr. Adams, of Elgin, and Dr. Witherstine, of Rochester.

The New Southern Minnesota Medical Association

The Minnesota Valley Medical Association and the old Southern Minnesota Medical Association existed side by side for eighteen years. There was considerable duplication of function and overlapping of territory. Many physicians were members of both. A merger of the two associations obviously was indicated and was effected, as has been said, on August 3, 1911, thirty-five years ago, at a meeting in Rochester. An entirely new society was formed but the name, Southern Minnesota Medical Association, was retained, as has been pointed out. This name was considered appropriate because the object of the organization was to serve the needs of members of the medical profession in the southern part of the state.

Dr. L. A. Fritche of New Ulm was the first president of the new society. Following the merger, the society grew rapidly. Programs became elaborate and meetings extremely well attended. Many national figures appeared on the programs. For instance, in 1914, the guest speakers included Dr. Bertram W. Sippy, Dr. Dean Lewis, Dr. Allen B. Kanavel, Dr. Oliver S. Ormsby, Dr. H. M. McClanahan, Dr. James S. Goetz, and Dr. Arthur D. Dunn.

In 1919 it was apparent to many members that the association had become too large and its pro-

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GLOMUS TUMORS

Report of Two Cases

HENRY W. MEYERDING, M.D. and JAMES H. VARNEY, M.D.

Rochester, Minnesota

GLOMUS tumors may cause excruciating pain. Because of their rarity they may remain unrecognized for years. Recently we have operated on two patients who had glomus tumors of nine and sixteen years' duration, respectively. In each case there was complete relief of symptoms. Early diagnosis and eradication are dependent on the recognition of the lesion by the general practitioner when he is consulted.

Glomus enlargements, or arteriovenous shunts, occur normally in skin and subcutaneous tissue. They occur most frequently in the finger tips, where they regulate temperature when the hands are exposed to cold. With increased growth of these tumors, they become excruciatingly painful. They are usually located under the nail in the visible part, or as far back as the root of the nail under the skin, where they may be more obscure. The most common source of histologic material for the study of the glomus has been the foot of the goose, where the glomus attains a large size normally and maintains the temperature of the foot. These shunts never have been found in cold blooded animals such as the reptiles.

Mason and Weil⁵ have written the most comprehensive report on glomus tumors. They stressed the wide distribution of the tumors aside from the usual subungual location. They found the tumors located over the acromion, on the palmar surface of a finger, in the forearm, in the arm at the insertion of the deltoid, in the thigh, in the leg, in the knee joint, under the toenails and in the sole of the foot. The essential finding which should lead one to suspect a glomus tumor is any very painful, discreet region of trigger-like pain, where a small grayish blue or reddish purple nodule can be palpated or seen. In the differential diagnosis, subungual hematoma, fibroma, epithelioma, angioma, neuroma and melanoma have been mentioned, but in none of these is there the typical paroxysm of pain.

Treatment of the lesion consists in simple excision. The tumors are well encapsulated and easily shelled out. Occasionally the tumor may be very

tiny and found with difficulty. In these cases Love²⁻⁴ uses the "pin test," consisting of locating the tumor by means of a sharp pin; after it is found, the pin is left in place while nerve block



Fig. 1. Position and small size of glomangioma, also incision for removal. The majority of these tumors are subungual.

is performed with procaine at the base of the finger. In this manner, the lesion can be completely removed, as its exact location is known.

The tumors are essentially neuromyo-arterial nodules in the subcutaneous tissue as described by Dockerty.³ The arteriovenous short circuits consist essentially of (1) an afferent arteriole, (2) an efferent venule, (3) various small connecting loops lined by endothelium, the canals described by Sucquet-Hoyer. These canals can be opened or closed quickly as a result of local nerve reflexes. The nodules are usually very small bluish ones that are exquisitely tender. Microscopically, there are anastomosing vascular spaces, some with thick walls, others with thin walls. Around these vessels there are numerous small cells, which resemble nevus cells (small with oval nuclei, small nucleoli and speckled chromatin). Some pathologists consider these cells to be endothelial in ori-

Dr. Meyerding is in the Section on Orthopedic Surgery, Mayo Clinic, and Dr. Varney is a Fellow in Orthopedic Surgery, Mayo Foundation, Rochester, Minnesota.

gin; others consider them to be epithelioid cells or even myoblasts. Smooth muscle and nerve fibrils may be seen intermingled with the other elements. The presence of oval, dark-staining cells in a

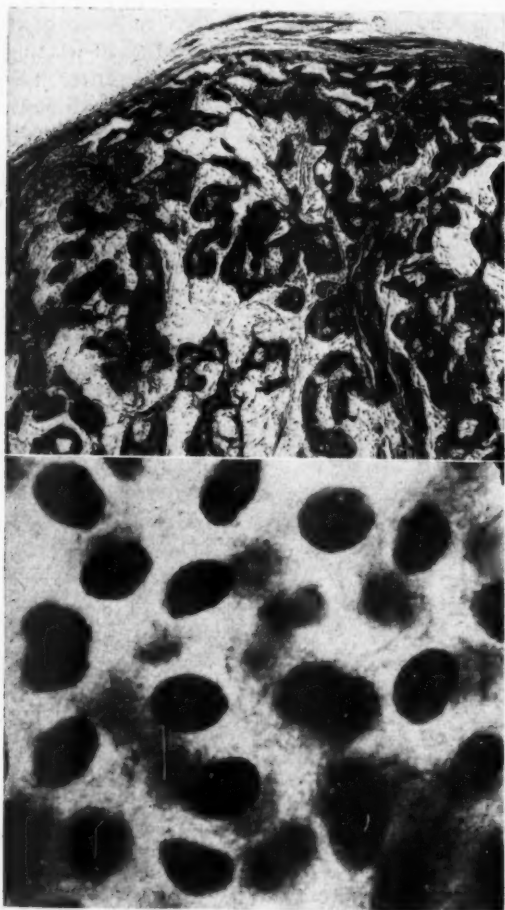


Fig. 2. (above) Encapsulated glomangioma showing the general architecture with small nests of nevus-like cells in a myxomatous stroma. Several dilated vascular canals are visible at the top of the photograph ($\times 35$).

Fig. 3. (below) High power detail of the endothelial, nevus-like cells comprising the bulk of the tumor ($\times 1,300$).

vascular network with occasional nerve fibers and end organs should determine the diagnosis.

Report of Cases

Case 1.—A housewife, forty years of age, reported at the Mayo Clinic with a history of an excruciatingly painful region of the right fifth finger, which was located under the base of the nail bed and had been present for nine years. The pain occurred with any pressure on this region and even the weight of the bedclothes would awaken her at night. The pain was trigger-like, sharp

and shooting and extended up the finger as far as the proximal phalangeal joint. She had noticed that the tumor turned reddish purple and enlarged during the painful spasm. With time, it had shown a slow increase in size and had become more painful. If she struck the finger the pain was so intense that she would turn pale and become faint. It was necessary to immerse the hand in as hot water as she could stand in order to obtain relief from her pain. The pain was more readily precipitated during cold weather than at other times. She had consulted a number of physicians during the nine years prior to admission and a diagnosis of arthritis of the terminal joint of the fifth finger had been made. She avoided shaking hands and was in constant fear of the recurrent paroxysms of pain. Physical examination revealed a small dusky red tumor under the right fifth subungual region. Almost all of it was lying under the cover of the skin at the base of the nail (Fig. 1).

The tumor was removed while the patient was under regional procaine block and tourniquet. A curved incision was used, incising part of the nail and extending up into the skin. Immediately beneath the upper part of the matrix could be seen a firm, grayish, rounded tumor, 5 mm. in diameter, which was dissected free and removed in toto. The grayish color of this tumor resulted from pressure under the nail and the tourniquet. The pathologist reported this tissue as an encapsulated subungual glomangioma (Figs. 2 and 3). The incision healed by primary intention and the patient experienced complete relief of symptoms.

Case 2.—A housewife, forty-two years of age, complained of a painful tumor located on the mesial aspect of the distal phalanx of the left index finger, which had been present for more than sixteen years and had interfered with her work. It had been operated on twice, the last time being about fourteen years prior to her admission at the Mayo Clinic. However, the tumor had not been located and the patient had not obtained relief of symptoms. Examination revealed a mass of scarlike tissue, which was tender on palpation. The roentgenograms showed this mass to be confined to the soft tissues. The roentgenograms of the lungs were negative. The blood count, urinalysis and flocculation test gave negative results. Excision of the tumor was performed while the patient was under regional procaine block and tourniquet. A small nerve and a blood vessel were seen entering the scarlike mass proximally. These were cut and tied. The surgeon suspected that the lesion was a neurofibroma but when the pathologist examined the tissue, he found that it was a glomus tumor. The tumor itself was very small, 1 mm., and was surrounded by fibrous tissue from previous operations. A number of sections had to be cut to find the hemangiomatous tissue with the typical oval, dark-staining cells of a glomus tumor. The incision healed by primary intention and the patient obtained relief from her symptoms.

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MINNESOTA MEDICINE

CHRONIC MASTOIDITIS WITH CHOLESTEATOMA AND STENOSIS OF THE EXTERNAL AUDITORY MEATUS

Report of Two Cases

H. I. LILLIE, M.D., and JAMES B. McBEAN, M.D.

Rochester, Minnesota

IT IS well known that stenosis of the external auditory canals presents a diagnostic problem in cases in which pain or discharge is present. The following cases are presented with two purposes in mind: first, to call attention to this difficult diagnostic problem, and second, to emphasize the importance of adequate drainage in cases of chronic otitis media.

Stenosis of the external auditory canal may be congenital, in which case the patient has no symptoms referable to the ear and it is usually possible to insert a small ear speculum and obtain a reasonably satisfactory view of a normal tympanic membrane. Acute otitis externa frequently produces such swelling in the auditory canal that inspection of the tympanic membrane is impossible. In these cases the disease is of short duration, the pain is localized in the ear itself and there is pain on moving the auricle or pressing on the tragus. If a small speculum can be inserted and the discharge cleaned out, the hearing is found to be normal.

When stenosis is produced by chronic otitis media, there will be a long history of discharge from the ear. The pain is more deep-seated, the patient usually complains of deep headache in the temporal and mastoid region, and the hearing is usually much diminished. There is no pain on movement of the auricle but there may be a deep mastoid tenderness.

Report of Cases

Case 1.—A white man, aged twenty-two years, registered at the Mayo Clinic on April 16, 1946. He complained of discharge from the left ear since the age of six years. At that time he had a head injury, was not unconscious but was "dazed" for a day or two. He did not remember whether there was bleeding from the ear at that time. There had been a constant dull ache in the ear for a long time with occasional exacerbation of more severe pain. At the time of examination he was having severe steady pain in the ear and left side of the head.

Examination revealed almost complete stenosis of the left external auditory canal with purulent, foul smelling discharge present. There was profound con-

duction type deafness on the left. General physical examination gave negative results. On roentgenographic examination, sclerosis of the left mastoid was observed. On April 18, 1946, the left mastoid was explored through a postauricular incision. Hypertrophic osteitis had caused considerable sclerosis but there were still a large number of cells present, all of which contained pus under pressure. These cells were uncovered in the mastoid tip, behind and above the knee of the sigmoid sinus. In the region of the mastoid antrum a large abscess had uncovered the dura of the middle fossa. A tract of infected cells was explored inferior to the labyrinth leading toward the petrous apex. In the middle ear, medial to the stenosis of the external canal, was a large cholesteatoma. This was removed. The cholesteatoma had caused a large cavitation in the middle ear and adjacent tissues. Radical mastoidectomy was completed by removing the posterior bony wall of the external canal, making one cavity of the external canal, middle ear and mastoid cavity. A plastic skin flap was cut in the membranous canal and turned back into the cavity, which was lightly packed with vaselin gauze. The wound was tightly closed.

The patient's postoperative course was smooth and uneventful. Penicillin, 160,000 units daily, was administered. He was dismissed from the hospital on the eighth postoperative day and observed in the clinic for three weeks. All discomfort and pain had disappeared.

He was seen again two months later, at which time he felt well and made no complaints. The cavity had become almost completely epithelized.

Case 2.—A white, married woman, aged thirty-nine, registered at the Mayo Clinic on April 15, 1946. She gave a history of purulent discharge from the right ear since an attack of measles when she was eight years old. In the past five years she had had four exacerbations with severe pain, lasting about three weeks and relieved when the ear discharged profusely. During these episodes the pain was worse at night than during the day.

Examination revealed severe stenosis of the right external auditory canal with purulent discharge present. The stenosis prevented examination of the tympanic membrane. There was a moderately severe conduction type deafness on the right. General physical examination revealed mild asthmatic bronchitis and rheumatic mitral endocarditis. On roentgenographic examination partial sclerosis of the right mastoid was observed.

Exploration of the right mastoid process was done on April 20, 1946. There was extensive cellular development and the intercellular septa were sclerosed. The cells contained greenish brown fluid and thickened mucous membrane. Cells were removed in the tip, around

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From the Section on Otolaryngology and Rhinology, Mayo Clinic, Rochester, Minnesota.

FURTHER OBSERVATIONS ON THE PROGNOSIS IN ANGINA PECTORIS DUE TO CORONARY SCLEROSIS

A Study of 405 Patients Who Survived Ten or More Years

GEORGE E. MONTGOMERY, JR., M.D., THOMAS J. DRY, M.B., and ROBERT P. GAGE, M.S.
Rochester, Minnesota

IN MAY, 1946, Parker, Dry, Willius and Gage¹ reported on the survival rate of 3,440 patients who had angina pectoris due to coronary sclerosis.

The conclusions of this study, in effect, were: (1) the highest mortality rate occurs in the first years after the onset of the disease; (2) the survival rate was definitely lower when the disease manifested itself before patients were forty years old than when they were older; (3) the survival rate of females was greater than that of males; (4) when sclerosis of the choroidal arteries was associated, the five-year survival rate was much lower than it was when this condition was absent, and (5) associated cardiac hypertrophy, hypertension (especially hypertension of groups 3 and 4 of the Keith and Wagener² classification), previous myocardial infarction, congestive heart failure and significant electrocardiographic abnormalities (particularly conduction defects and disturbances of rhythm) all influence prognostic trends adversely. Attention was drawn to the curious observation that the inverted T_{1,2} pattern seems to be associated with a less favorable prognosis than all other types of inverted T wave patterns.

Among this group of 3,440 patients were 405 who had survived ten years or longer after the diagnosis of angina pectoris was made at the Mayo Clinic. The following report is based on a more detailed analysis of this group. A study of data about patients who have survived for a long time has the advantage of providing a viewpoint in retrospect which serves to reflect prognostic trends.

When information concerning these 405 patients was last received, 281 (69.4 per cent) of the group were still living; fifty-four (13.3 per cent) were known to have died of cardiac disease; eighteen (4.4 per cent) had died of other

TABLE I. AGE OF PATIENTS AT TIME OF DIAGNOSIS OF ANGINA PECTORIS AT THE CLINIC.

Age of patients, years	Cases	Per cent
20-29	2	0.5
30-39	11	2.7
40-49	96	23.7
50-59	177	43.8
60-69	109	26.9
70-79	9	2.2
80-89	1	0.2
Total	405	100
Mean age	55.1 years	

disease, and fifty-two (12.8 per cent) had died of unknown causes.

In general, the age distribution at the time of diagnosis at the clinic of this long-surviving group (Table I) was similar to that noted by Parker and his co-workers¹ for the entire group, the average age being four years younger. However, the sex ratio shows an interesting change, for, whereas it was reported as 4.3 males to 1 female for the whole group, we found that, of the 405 patients who survived ten years, 292 were men and 113 were women, a ratio of 2.6 to 1. This change in the sex ratio reflects emphatically the well-known fact that females who have the disease survive much longer than males who have the disease.

As in the original study, we found that those patients who had cardiac enlargement, congestive heart failure and the more severe type of hypertension, and those who had choroidal sclerosis, did not fare well. They were poorly represented among these long survivors. Thus, only sixty-eight (16.8 per cent) of the 405 patients were found to have had cardiac enlargement; only ten patients (2.5 per cent) gave a history indicative of an episode of congestive failure; only seventy-nine patients (19.5 per cent) had hypertension, and none of these had hypertension group 3 or 4. In only fifteen of 237 cases in which a record of fundoscopic examinations was found, was sclerosis of the choroidal arteries present at the time of the original diagnosis of angina pectoris at the clinic.

Dr. George E. Montgomery, Jr., is a Fellow in Medicine, Mayo Foundation, Rochester, Minnesota; Thomas J. Dry is a member of the Division of Medicine, Mayo Clinic, and Robert P. Gage is with the Division of Biometry and Medical Statistics, Mayo Clinic, Rochester, Minnesota.

Influence of Acute Myocardial Infarction

At the time of the original diagnosis of angina pectoris at the clinic, seventy-one patients (17.5 per cent) had had previous coronary occlusion. Only 3.7 per cent of the patients in the group are known to have had coronary occlusion subsequently. While others may have had unrecognized or unreported episodes of myocardial infarction, the number is impressively small among those who survived for ten years or longer after the diagnosis was made at the clinic. Isolated instances of multiple infarction among the long survivors provide the exception that proves the rule.

Electrocardiographic Findings

A detailed study of the electrocardiograms was made in these 405 cases in an effort to determine what, if any, are the significant changes that may occur which would aid the physician in giving a correct prognosis to the patient suffering from angina pectoris.

In 236 cases (58.3 per cent) in this group, the initial electrocardiogram was considered to be normal. The electrocardiographic abnormalities among the remainder consisted mainly of (1) inversions of the T wave, which can be considered to be either relics of acute myocardial infarction or the result of hypertension; (2) auriculo-ventricular and intraventricular conduction disturbances of various types, and (3) disturbances of rhythm (Table II). The relative infrequency with which the initial electrocardiogram revealed conduction disturbances, and the infrequency with which it revealed ectopic rhythm in this long-surviving group, reflect a significant prognostic trend and need no further comment. As far as abnormalities of the T wave are concerned, the point worthy of re-emphasis is the infrequency (seven cases) with which the inverted $T_{1,2}$ pattern occurs in this group in comparison with all other abnormalities of the T wave. There were thirty cases in which the electrocardiographic findings became normal after having been found to be abnormal initially. In only one was the original abnormality an inversion of the $T_{1,2}$ waves. The remainder of the abnormalities were divided about equally among T_1 inversion, $T_{2,3}$ inversion and $T_{1,2,3}$ inversion. What makes this fundamental prognostic difference between this $T_{1,2}$ pattern on the one hand and the T_1 pattern (and for that matter other combinations of inversions of the T waves) on the other, is difficult to explain.

TABLE II. ELECTROCARDIOGRAPHIC FINDINGS AT TIME OF DIAGNOSIS IN PATIENTS SURVIVING TEN YEARS OR MORE WITH ANGINA PECTORIS.

Electrocardiographic findings	Cases*	Per Cent
Normal	236	58.3
Inverted T_1	44	10.9
Inverted $T_{1,2}$	7	1.7
Inverted $T_{2,3}$	43	10.6
Inverted $T_{1,2,3}$	14	3.4
Left bundle-branch block (concordant)	9	2.2
Left bundle-branch block (discordant)	1	0.2
Right bundle-branch block	0	—
Wide S wave	2	0.5
Complete heart block	0	—
Delayed auriculoventricular conduction	3	0.7
Auricular fibrillation	3	0.7

*No totals are given because several of the noncontributory electrocardiographic classifications are omitted.

In 154 cases, subsequent electrocardiograms were available for further study and for comparison with those obtained at the clinic at the time of the diagnosis of angina pectoris.

It is noteworthy that in sixty-seven cases in which the original electrocardiogram was normal, no significant changes occurred in the subsequent electrocardiograms. These sixty-seven cases comprised 70 per cent of those in the group of 154 cases in which the original electrocardiogram was normal. Moreover, in half of the cases in which the electrocardiographic findings were originally abnormal, they were found to have returned to normal at a subsequent examination. This illustrates the tendency for the electrocardiographic findings to remain normal or to return to normal among the long-surviving subjects with angina pectoris due to coronary sclerosis.

The prognostic trend in so far as the electrocardiographic criteria are concerned is reflected further by comparing the five-year survival rate of all patients who had angina pectoris due to coronary sclerosis with the survival rate among our group who lived ten years or longer (Table III).

Comment

The normal heart possesses collateral channels which may, for the most part, remain functionless until occlusive changes in the main arteries or their branches stimulate them to supplement

ANGINA PECTORIS—MONTGOMERY ET AL

TABLE III. FIVE-YEAR AND TEN-YEAR SURVIVAL RATES OF PATIENTS HAVING
ANGINA PECTORIS ACCORDING TO ELECTROCARDIOGRAPHIC
CLASSIFICATION.

Results of Electrocardiogram	Traced Patients*†	Lived Five or More Years Following Diagnosis at Clinic		Traced Patients*†	Lived Ten or More Years Following Diagnosis at Clinic	
		Number†	Per Cent		Number†	Per Cent
Normal	1,112	772	69.4	571	236	41.3
Inverted T ₁	445	190	42.7	214	44	20.6
Inverted T ₁ , 2	228	51	22.4	130	7	5.4
Inverted T ₂ , 3	363	174	47.9	181	43	23.8
Inverted T ₁ , 2, 3	140	54	38.6	61	14	23.0
Left bundle-branch block (concordant)	126	39	31.0	65	9	13.8
Left bundle-branch block (discordant)	102	33	32.4	19	1	5.3
Right bundle-branch block	5	2	40.0	1	0	—
Wide S wave	25	14	56.0	8	2	25.0
Complete heart block	4	1	25.0	2	0	—

*Inquiry as of January 1, 1942. The five-year group includes only those cases in which the diagnosis of angina pectoris was made five or more years prior to the time of inquiry, that is, 1936 or earlier; the ten-year group includes only those cases diagnosed in 1931 or earlier.
†No totals are given because several of the noncontributory electrocardiographic classifications are omitted.

the arterial supply to the myocardium. Herein might lie congenital or hereditary factors which decide the fate of the individual patient who has coronary arteriosclerosis and its complications. Because coronary sclerosis is inevitable with aging and at times is accelerated by coexistent disease, such as hypertension, diabetes, obesity or myxedema, the future course can well be pictured to depend on which process—the occlusive or the supplemental—exhibits the greater potentiality toward progression.

Given an instance in which the arteriosclerotic process in itself is diffuse and rapidly progressive or in which the anatomic arrangement of the main coronary arteries is such that the left ventricle receives its blood supply almost entirely from one or the other of the coronary arteries (thus vitiating the establishment of adequate supplemental circulation should this important channel become sclerotic) or in which the clinical course is punctuated by repeated episodes of myocardial infarction, the outlook must of necessity be unfavorable. However, given an instance in which the occlusive process is slow or limits itself to a minor branch of a coronary artery, in which the groundwork for collateral circulation is unusually adequate because of a fortuitously favorable anatomic arrangement of the coronary vessels or in which factors capable of aggravating arteriosclerosis are absent, the outlook is more favorable and acute myocardial infarction constitutes a much less hazardous event. It is pos-

sible that a minor occlusive episode in certain instances such as these, may even stimulate the establishment of collateral circulation. Therefore, the fact that the mortality rate is high in the earlier years after the inception of this disease is understood readily. In those cases in which the coronary circulation is prepared against the effects of both gradual and sudden interference with arterial supply the patients can be expected to survive this stormy period.

Finally, we can speculate, with some reservations, on the degree to which treatment influences prognosis. Given a large number of patients suffering from the same disease who can be assumed to receive essentially the same treatment what, other than natural endowments inherent in coronary circulation, could account for the wide variation in the subsequent course? One answer might well be the difference in ability of patients to make the necessary physical and psychologic adjustments which the disease imposes. The limiting effect of anginal pain ordinarily precludes overindulgence in physical activity. Unfortunately, this is not always true of overindulgence at the table. Still less can we expect successful psychologic adjustments in patients already in middle age or older, whose habits have become fixed, who often have reached the most responsible part of their life and who inherently fear the possibility of a cardiac disorder. Fear, as a potent vasoconstrictor, can only influence the successful establishment of collateral circula-

tion adversely and perhaps to an extent more lastingly than some other environmental influences, not excluding excesses in some habits.

Summary and Conclusions

In this report, data concerning 405 cases in which the patients survived ten years or longer after the diagnosis of coronary sclerosis and angina pectoris were analyzed.

The ratio of men to women in this group was 2.6 to 1.

This study further revealed that cardiac enlargement, coronary occlusion and congestive heart failure, when associated with angina pectoris, definitely increase the mortality rate. The infrequent occurrence of choroidal sclerosis in this group indicates that it is an unfavorable prognostic finding.

Not a single patient with hypertension, group 3 or 4, was represented in this long-surviving group.

The number of cases in which electrocardiographic findings were normal in this group was high. In addition, when initial and subsequent electrocardiograms were compared a tendency of the electrocardiographic findings to revert toward normal was noted in cases in which they were initially abnormal. The negative $T_{1,2}$ pattern apparently indicates unusually severe damage to the heart, because for patients who had this abnormality in their initial electrocardiogram, the mortality rate was extremely high as compared to other patterns which are considered to be relics of previous myocardial infarction.

In the final analysis, the most potent factor in determining prognostic trends probably centers around the success or failure of establishment of adequate intercoronary anastomoses.

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CHRONIC MASTOIDITIS

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and posterior to the sigmoid sinus, and in the root of the zygoma. The dura of the middle fossa had been exposed by the disease process in two places. The middle ear and external canal medial to the stenosis were packed with cholesteatoma, which was removed. Radical mastoidectomy was done and a plastic flap was turned back from the external membranous canal. The cavity was lightly packed and the incision was closed. The postoperative course was uneventful and the patient was given penicillin, 160,000 units daily, for four days. She had no further pain. She returned for observation two months later, at which time she felt well. The ear canal was open and the mastoid cavity was almost dry.

Comment

The first patient had been recently discharged from the army. While overseas, he had had a flare-up in his ear and had been treated for otitis externa. The character of his pain and the history of discharge for many years should have enabled the attending physician to make the diagnosis. In both cases, the severe stenosis of the canals had prevented adequate drainage from

what otherwise might have been benign otitis media. In both cases the infection had spread throughout extensively pneumatized mastoid processes and had uncovered the dura, forming an epidural abscess in one case. Irritation of the exposed dura is the cause of the deep-seated pain.

In both cases cholesteatoma had formed medial to the stenosis of the ear canal. This is due to the piling up of desquamated epithelium.

Summary

Two cases of extensive chronic mastoiditis with stenosis of the external auditory canal are presented in which the extensive disease process and cholesteatoma are aggravated by lack of adequate drainage. In order to prevent extension to intracranial structures or to the sigmoid sinus, surgical intervention is urgent in cases of chronic otitis media when there is obstruction of drainage due to stenosis of the external auditory canal. No other type of treatment is adequate.

POLYNEURITIS

Differentiation of Infectious Polyneuritis (Guillain-Barré Syndrome) and the Neuritis of Porphyria

MAJOR CHARLES L. YEAGER, Medical Corps, AUS
Waco, Texas

IN the study of multiple neuritis, two syndromes merit careful clinical differentiation: the so-called infectious polyneuritis or Guillain-Barré syndrome, and the polyneuritis of acute porphyria. Each has been presented at length in the literature, but a close diagnostic differentiation has not been made between them. During an acute episode of porphyria, the neuritis may not differ from polyneuritis of any cause; but similarities are even more striking between the so-called acute infectious polyneuritis and porphyria because of the obscurity of etiology in both cases, the traceable toxic factors in many cases of porphyria, the equally rapid onset of symptoms in both cases, and the similarity in length and course of the two diseases. However, the difference in prognosis is so striking that the two conditions should be differentiated early. In infectious polyneuritis, one may feel reasonably assured of recovery, whereas, in porphyria, an ultimate fatal outcome is anticipated.

Several splendid reviews of the literature have been written describing infectious polyneuritis^{5,6,10,18} and porphyria,⁸⁻¹² to which the reader may refer for more complete discussion.

Infectious Polyneuritis (Guillain-Barré Syndrome)

In 1892, Osler¹⁵ described a form of acute febrile polyneuritis with Landry's ascending type of paralysis. In 1916, Guillain-Barré and Strohl⁷ likewise demonstrated cases of supposed infectious polyneuritis in which the spinal fluid contained high quantities of protein and low cellular content, known as albuminocytologic dissociation, which in combination with multiple neuritis has come to be known as the Guillain-Barré syndrome. Other terms describing the condition are encountered with confusing frequency.¹⁶

The cause of infectious polyneuritis has not been adequately demonstrated. Both Osler¹⁵ and Guillain⁶ believed that the condition had an infectious etiology, but Gilpin and his associates³ were of the opinion that a virus is the causative agent. The disease is no respecter of persons, and both

sexes are affected equally. Although no age is exempt, the majority of cases occur in individuals between the ages of twenty and forty. There is no apparent diathesis for the disease, and the strong and otherwise healthy person may be struck down. Cases occur both epidemically and sporadically, but there is some seasonal variation, the greater incidence paralleling upper respiratory infections in changeable fall and spring weather. Familial and hereditary tendencies are not demonstrable. As a rule, psychogenic symptoms and personality disturbances are not elicited.

The Guillain-Barré syndrome is a multiple neuritis, involving in various degrees the peripheral spinal nerves and nerve roots, as well as the cranial nerves. Of the cranial nerves, the seventh nerves are the most commonly affected, resulting in unilateral or bilateral facial palsy. The motor nerves are more severely involved than the sensory.

Frequently, at the outset, the otherwise healthy individual is stricken with an acute upper respiratory infection which is accompanied by mild to moderate fever, malaise and gastrointestinal disturbances. The acute episode subsides and complete recovery is apparent.

Within a few days to a few weeks, the first signs of neuritis become apparent. Although ultimately impairment of motor nerve function is more severe than impairment of sensory function, sensory symptoms may appear long before weakness is noted. At the outset, there are paresthesias of the hands and feet, deep aching and tenderness of the large muscle groups of the extremities and body, and scattered areas of dysesthesia and paresthesia over the body and face. In some cases, there is no demonstrable objective sensory deficit throughout the course of the disease; in others, glove and stocking type of sensory loss develops in all modalities.

Days or weeks after the appearance of sensory changes, progressive flaccid paralysis sets in, beginning in the distal portion of the lower extremities or of the lower and upper extremities simultaneously, and spreading proximally in the

pattern of Landry's paralysis. Weakness is usually uniformly bilateral, but impairment may show unilateral predominance. While the onset of weakness is in the fine distal muscles, the large proximal muscles of the shoulder and pelvic girdles, arms and thighs, are most severely affected. When the paralysis reaches its maximum, any remaining movement is confined to the small muscles of the hands and feet. As paralysis ascends, the large muscles of the trunk fail, and respiration is embarrassed by paralysis of the intercostal nerves so that the burden of respiration is placed upon the diaphragm. If the diaphragm fails, death may ensue. It has been noted that if paralysis is sufficiently complete to warrant the use of a respirator, death is imminent.

Development of the disease is dramatic and very incapacitating, yet the prognosis is exceedingly favorable. The mortality rate varies from 16 to 25 per cent, but good nursing care through the critical period in which the patient is helpless frequently averts death. A good prognostic maxim is that if one is able, by any means, to keep the patient alive during the critical period of maximum paralysis, complete recovery is reasonably assured.

All the cranial nerves may be involved. The seventh is the most susceptible, resulting in bilateral peripheral palsy with facial diplegia.¹ The extrinsic muscles of the eye may become noticeably affected, resulting in partial or complete fixation of the eyeball. Paralysis of the intrinsic muscles of the eye, as well, has been observed. Sensation of the face may be changed, both subjectively and objectively. Hearing is seldom affected. Involvement of the ninth, tenth, eleventh and twelfth nerves present numerous and various patterns of disturbance, resulting in deglutition, taste loss, taste distortion, increased salivary secretion and disarticulate speech.

All deep reflexes are lost, but the superficial reflexes are usually preserved. Signs of pyramidal tract involvement are lacking, muscles are flabby, and tone is destroyed. The picture is that of a lower motor neuron paralysis.

Accurate co-ordination studies are seldom obtained because of the marked motor disability. Response to galvanic and faradic stimulation is reduced or lost.

Although albuminocytologic disassociation in the cerebrospinal fluid is a common finding, the phenomenon is by no means constant. The fluid

may be under increased pressure. Some of the cases described by Gilpin et al³ showed choking of the optic disc, indicating significant increase in intracranial pressure. Systematically, there may be evidence of liver and heart damage.

Pathologic changes are not specific. The peripheral nervous system is primarily involved, resulting in demyelination and Wallerian degeneration. Severe neuron changes in the central nervous system have been demonstrated. There may be edema of the brain and spinal cord with scattered petechial hemorrhages.

Treatment is supportive, and success hinges on skilled nursing care. Although the administration of vitamins is routine, little can actually be said in its behalf. Recovery follows with or without vitamin intake. The administration of beer and salt, although strictly empirical, seems to be a pleasant source of vitamins and minerals. Physiotherapy helps to maintain muscle tone and prepares the individual for more rapid recovery when nerve regeneration develops.

Polyneuritis with Porphyrria

Porphyrria is a heredofamilial constitutional disorder of pigment metabolism with protean manifestations, resulting in excretion of large quantities of uroporphyrin and coproporphyrin in the urine.

A red complex pigment termed hematoporphyrin was originally synthesized by the action of strong sulphuric acid on hemoglobin.^{8,10,12,13,21} It has been demonstrated that hematoporphyrin occurs normally in small amounts in the urine.^{8,11,14} In 1911, Gunther⁸ described a condition in which pigments were excreted in the urine in such large quantities that the urine became a dark burgundy wine color. He attributed the condition to an anomaly of pigment metabolism and called the disease hematoporphyrria. In 1924, Fischer² demonstrated that individuals with hematoporphyrria excreted gross quantities of uroporphyrin and coproporphyrin in the urine but not hematoporphyrin, which apparently does not appear in nature but is only a laboratory product. Therefore, porphyrria is considered the correct terminology for the disease in question.

The porphyrias are classified into chronic porphyrria, congenital porphyrria and acute porphyrria. Acute porphyrria takes on two forms with identical clinical manifestations, but presumably the acute toxic form is distinguished from the idio-

pathic form only by evidence of some toxic substance acting as the precipitating agent.^{11,12,20}

Chronic porphyria is a neuropathic disease which is manifested by signs of chronic nervous system irritation. There are recurrent episodes of irritability, restlessness, insomnia and multiple vague gastro-intestinal complaints. Porphyrins may or may not be excreted in the urine. The condition is referred to as "porphyrimis." Considerable doubt exists as to whether there is such a disease entity.

Congenital and acute porphyria differ not only symptomatically but also, according to the beliefs of Gunther,^{9,10} in their basic constitutional diatheses. The underlying abnormal basis of the congenital form was referred to as "porphyrosis" and that of the acute form as "porphyrimis." Even though, in porphyrosis, manifestations are systemic, there is a definite but hidden neuropathic constitutional factor. In porphyrimis, on the other hand, the nervous system is directly involved, giving rise to general nervousness, anxiety reaction, insomnia, irritability, depression and organic psychotic reactions (delirium).

Congenital porphyria, a Mendelian recessive disease, dominant in males, is characterized by its development in early infancy, the appearance of large quantities of porphyrins and other pigments in the urine, and photosensitive skin with purplish brown pigmentation of the skin and teeth. The pigmentation is the result of deposits of uroporphyrin I in the sublayers of the skin and teeth. Uroporphyrin I is excreted in large quantities in the urine. The predominant skin lesions are the disfiguring hydro-aestivale or vacciniiforme. Photosensitivity, in the presence of exposure to intense or prolonged light, leads to restlessness, generalized pruritis, accelerated pulse and respiration, weakness, coma and possibly death. Skin necrosis may develop secondary to vascular constriction. Recurrent episodes lead to chronic hardening of the skin, resembling scleroderma.

Acute porphyria is inherited as a Mendelian dominant, appears later in life, usually during the third or fourth decade, is more frequent in females than in males in a ratio of 3:1. Photosensitivity and discoloration of the teeth are rare; largely, uroporphyrin III is excreted in the urine.

Acute porphyria has been subclassified as acute idiopathic porphyria and acute toxic porphyria. The diseases are indistinguishable. The latter differs etiologically in that there is an apparent

idiosyncrasy to certain toxic agents, among which are acetanilid, nitrobenzol, barbiturates and sulfonamides. Latent forms^{15,17,20,21} of porphyria have been described in which abnormal quantities of porphyrins are excreted in the urine in the absence of clinical symptoms. Conversely,^{17,21} characteristic symptoms may appear in the absence of excretion of porphyrins. The porphyrin pigments may appear only during the peak of an attack, disappearing from the urine as symptoms subside, or the urine may remain free of porphyrins even during the height of an attack, but the symptoms and signs warrant the diagnosis. The condition in which porphyrins are not present was referred to by Waldenstrom²¹ as "porphyria without porphyrins."

Acute porphyria is really a chronic familial disease characterized by exacerbations and remissions. Family and early personal history indicate numerous ill-defined nervous manifestations which may be considered in the category of psychoneurosis.

The disease is manifested clinically by recurrent colic-like abdominal pain, involving the lower quadrants and centering about the umbilicus with radiation to the flanks, thighs or chest. An acute episode may be preceded for months by unexplained weakness, nervousness, sleeplessness, and vague flitting pains in the abdomen and extremities.

The protracted mild illness is followed by sudden onset of severe abdominal cramps, nausea, vomiting, severe constipation, accompanied by fever and leukosytosis. The abdomen is soft, but excruciatingly tender. X-ray of the abdomen reveals dilatation of the duodenum, ileum or large bowel. There may be signs of paralytic ileus. The general physical examination is usually normal. During the attack, the urine is the color of burgundy wine and contains porphyrins. Watson and Schwartz²² devised a simple test for porphobilinogen, a colorless chromogen substance, which when found in the urine is pathognomonic of acute porphyria. Approximately 80 per cent of individuals with porphyria, in contrast to the 20 per cent with the Guillain-Barré form of polyneuritis, ultimately terminate fatally.

Common among the neurologic signs is paresis and paralysis. Both efferent somatic and efferent sympathetic motor nervous systems are affected by the disease. Among the more frequent forms of paralysis is Landry's ascending type,

which may result in death if the respiratory muscles are paralyzed. Waldenstrom²¹ and Roth¹⁷ have pointed out that irregular forms of paralysis involving scattered groups of muscles are equally common. Although subjective sensory symptoms in the form of paresthesias occur, in consideration of the severity of motor involvement the absence of sensory defect is notable. Paralysis is of the flaccid type, involving all of the extremities, and may involve all cranial nerves, leading to signs of acute bulbar palsy with dysphagia, dysphonia and asphyxia. All deep reflexes become obliterated, but the superficial abdominal and cremasteric reflexes may be preserved. In a number of cases described by Gunther,⁸⁻¹⁰ anesthesia was widespread.

Involvement of the sympathetic nervous system as a result of changes in the abdominal autonomic ganglia is held responsible for the signs of constipation, colic and paralytic ileus.

One of the properties of porphyrins is the ability to produce spasm of smooth muscle,¹⁴ resulting in hypertension, oliguria, neuritis (secondary to spasm of the nutrient vessels of nerves) and amaurosis (secondary to retinal angiospasm).

Psychiatric manifestations in porphyria vary widely in type and degree and may lead to admission to a psychiatric hospital. The organic reaction type is secondary either to organic cerebral damage, as a result of degeneration of the parenchyma, or perhaps to metabolic disturbances. Gross evidence of organic damage to the brain may be lacking, and in such cases, the condition may be confused with the minor psychogenic reactions such as anxiety and hysteria, the impression being based on the vague abdominal cramps, bizarre patterns of motor weakness and transient attacks of amaurosis. These, in addition to a long history of functional nervous manifestations in the patient and members of his family, and the paucity of organic signs by exclusion lead to such misinterpretations.

Pathologic studies in acute porphyria show scattered pigment (both iron-free and iron-containing) throughout various organs. Large quantities of pigment are deposited in the liver. Vascular thromboses leading to impairment of function of various organs of the body have been known to occur. The preponderance of pathologic changes found at autopsy, however, are in the nervous system. There are parenchymatous degenerative changes in the mixed peripheral

nerves, with involvement primarily of motor fibers, scattered demyelination, and degenerative changes in the cells of the sympathetic ganglia, horn cells of the spinal cord, and Purkinje cells of the cerebellum. Although the peripheral nervous system and lower segments of the cord are involved more completely than the higher segments of the cord, bulbar signs, from time to time, are predominant.

In the congenital forms, pigment is deposited throughout the body, and pathologic changes within the nervous system are minimal.

Case Reports

Case 1. An enlisted WAC, aged twenty-five, was admitted to Lawson General Hospital, June 11, 1944.

Several days following a cold, the patient noted weakness and pain in the legs and numbness of the hands and feet on May 25, 1944. At that time, examination in the infirmary was not remarkable except for a slight dragging of both feet in walking. Because of increased disability in walking, it was felt advisable on May 27 to have her admitted to the station hospital. By May 30, walking was impossible, but paralysis continued to increase so that by June 11 it was complete in both lower extremities and trunk. Slight movement, however, persisted in the upper extremities. She could roll her head from side to side, but could not raise it. The muscles of her face and extrinsic muscles of her eyes were but slightly affected. All deep reflexes were absent. Flexion of the knee, hip and back was painful. Paresthesias of the extremities persisted. Fever and other physical signs of acute infection were absent.

Admission blood count, as well as subsequent blood counts, was within normal limits. Urinalysis was repeatedly normal. Examination of the spinal fluid on June 11 showed a very slight xanthochromic fluid which contained a 169 RBC and an occasional white cell. Smear and culture were normal. Sugar was 83 mg. per cent. X-ray of the chest on June 21 showed slight atelectasis in the anterior-posterior view, but this could not be demonstrated in the lateral view. Porphyrins were not found in the urine.

A diagnosis of Guillain-Barré syndrome was made. The patient remained afebrile. She was treated symptomatically with foot board to the extremities, frequent changes of position and high vitamin diet. On two occasions, she developed dyspnea which was considered due to atelectasis, and which disappeared with frequent changes in position. By June 25, a month after onset of the disease, improvement in strength was noted. Physiotherapy, which was begun shortly after admission, was continued and by the first of August the patient was able to mobilize enough strength to move about the bed without aid, but not until September was she able to walk without assistance. Improvement in strength continued until October 4, at which time a thirty-day furlough for continued convalescence was granted. She returned from the furlough in good condition Novem-

ber 3, and after a further brief period of convalescence, she was pronounced fit for full duty and was discharged from the hospital.

Case 2. A lieutenant colonel of the Air Corps, aged twenty-nine, a white, married man, who had ten and one half years of continuous service, was admitted to Lawson General Hospital on November 29, 1945.

The chief complaint on admission was generalized muscular weakness, numbness of the extremities, face and ears, disturbances of taste, and double vision.

History revealed no evidence of familial or hereditary diseases, and his personal history was entirely negative with respect to his present illness. He had no unusual childhood diseases referable to the nervous system. He was a well-educated man who has apparently been adjusted physically emotionally and socially.

Military service records revealed that he was in the tropics in Africa and the China-Burma-India Theater from August, 1942, to February, 1944.

The onset of the present illness is dated to October 1, 1945, when the patient was admitted to a station hospital in Illinois because of chills and fever. On admission, he was found to have a temperature of 103.8°. No cause for the fever was demonstrated, and evidence of malaria was lacking. The episode was considered an innocuous upper respiratory infection and on October 7, 1945, he was pronounced cured and returned to duty. Upon leaving the hospital he drove to Atlanta, Georgia, and remained well until October 14, at which time he took a fishing trip with his wife and brother. They all drank white mountain corn liquor. The others noted no ill effects but on the night of October 14, the patient after going to bed feeling well, was awakened during the night with intense nausea which soon gave way to protracted vomiting, retching and hiccups. After about three hours he was admitted to a station hospital near Atlanta, Georgia, and was found to be in partial shock. Intravenous fluids were administered with resulting improvement. At that time, he complained of difficulty in swallowing, but no positive neurologic signs were noted. The patient remained in the hospital for four days and because of improvement, he was discharged to his quarters.

On October 19, he was cognizant of all food tasting like chocolate. During the latter part of the day he was overcome by a second attack of nausea, vomiting and hiccups. He felt tingling sensation on the medial aspect of the left arm. On October 22, he experienced difficulty in focusing his eyes and became aware of double vision on looking to the right and left. By then, the paresthesias had spread to involve all extremities and his gait was staggering in character. By October 26 weakness and ataxia had progressed to an alarming degree and it was felt advisable to return him to the hospital. Upon admission, the strength of the large muscles of all four extremities was found to be noticeably reduced, and the extrinsic muscles of the eyes did not function co-ordinately, although, as yet no objective sensory deficit was demonstrable. There was a profound tenderness to deep pressure anywhere on the body. All deep reflexes were

reduced but the superficial reflexes remained active. A positive Lasegue sign was found bilaterally.

Laboratory studies on readmission were essentially normal. Glucose tolerance varied from 108 to 133 milligrams per cent, sugar being found in the urine. On October 29, a spinal fluid examination showed a clear fluid with 3 lymphocytes, negative globulin, negative Wassermann, a gold curve of 0011000000, and a total protein of 60 mg. per cent.

Because of rapidly developing paralysis, the patient was transferred to Lawson General Hospital on October 29, 1945. Upon admission, examination revealed severe impairment of the cranial nerves, loss of taste, paralysis of the extrinsic muscles of the eyes with immobilization of the eyeballs, complete bilateral ptosis, and nearly complete paralysis of the facial muscles. Generalized weakness was also progressing. He described paresthesia from the toes to the face. Deep muscle tenderness and pain upon movement were increasing. The deep and superficial reflexes by then were absent. Complete glove and stocking anesthesia extending to the mid-thigh and mid-arm regions had appeared. Within twenty-four hours, the condition had progressed to such extent that only the toes of the right foot and the fingers of the right hand could be wiggled slightly. Trouble in swallowing was encountered and respiration was difficult. Because of the graveness of the patient's condition all precautions were taken. He remained in this condition until the last week in December, at which time some improvement in strength was noted. From that point on, improvement was progressive and in four months, 80 per cent of the lost strength was recovered, and the only sensory disturbance was a mild hyperesthesia of the soles of the feet. This was considered a Guillain-Barré syndrome, and laboratory studies supported the diagnosis.

Urine porphyrins were negative. Throat cultures were negative. The spinal fluid on October 29 revealed a total protein of 60 mg. per cent, and on November 6 the total protein was 256 mg. per cent. On February 7, 1946, the total blood protein was 5.3; serum albumin, 3.7; serum globulin, 1.6; nonprotein nitrogen, 34; and urea nitrogen, 17. Cerebral spinal fluid examination on February 22, 1946, showed 160 mg. of total protein and a zone curve of 2211000000.

Case 3. A twenty-seven-year-old white WAC private of English descent, was admitted to Lawson General Hospital on April 5, 1945, complaining of paralysis of all four extremities and weakness of phonation and deglutition. At the age of five she had a tonsillectomy; at seventeen, an appendectomy; at twenty-five, because of irregular menses, a dilation and curettage was done, following which the menstrual cycle was normal. Her mother died at twenty-eight years of age of paralysis, the exact nature of which is unknown. The patient was ten years old at the time. She had a sister one year younger who had been observed in state institutions on a number of occasions because of emotional instability. There were two younger brothers, apparently healthy. The patient occasionally had tantrums which were described by her father as reminiscent of similar attacks evidenced by her mother before her death. The patient

completed grammar school but interrupted high school to obtain employment as a drill press operator. After working a while with a good record, she quit to enter the army.

She enlisted in August, 1944. On January 15, 1945, she developed recurrent cramping abdominal pain associated with the passage of about five loose normal-colored stools a day. She continued to perform her clerical duties and on February 6 went home on furlough. The abdominal colic continued and at times was severe enough to cause her to double up. She vomited occasionally but sought no medical aid until her return to the army air base to which she was assigned. On February 24, 1945, she reported to the dispensary and was immediately hospitalized. Physical examination, including rectal, pelvic and neurological studies were normal, except for generalized abdominal tenderness, most pronounced in both lower quadrants. She appeared anxious and emotionally unstable. She vomited occasionally but had no diarrhea nor fever.

Laboratory studies were normal except for the urine which appeared smoky, was positive for acetone, but otherwise was negative. X-rays of the chest and gastrointestinal tract were normal, except for some pylorospasm, which was not present on subsequent examinations.

She was given intravenous fluids, barbiturates and antispasmodic drugs, in order to relieve symptoms which were at first thought to be psychiatric in origin.

On March 10, the fourteenth hospital day, she stated that she was unable to control her arms and legs, which had become weak. Movement was choreiform in nature, and the extremities trembled when motion was attempted. The loss of strength was of a bizarre nature in that she could not rise from a chair, but if assisted to a standing position, she could walk the length of the ward. The diagnosis of hysteria was seriously entertained. On March 14, she developed bilateral flank pain, blood pressure of 160/120, and the urine revealed 2 plus albuminuria, 3 to 4 white blood cells per high-powered field, and a specific gravity of 1.023. Repeated tests resulted in similar findings. The blood nonprotein nitrogen and urea were normal. A spinal puncture was performed on March 29 with normal findings throughout. During the next few days her symptoms improved. She vomited less and complained of less abdominal pain. The blood pressure fell to 132/100, but there were no changes in the urine findings. Neurological examination showed loss of all deep reflexes except the knee jerks which could be elicited if re-enforced. Her temperature occasionally rose to 100° F. in the afternoon. Considerable wasting of the extremities and apparent weight loss were noted, although the weight was not recorded.

On April 4, she was seen to pass dark colored urine which contained neither blood nor bile. Ehrlich's test for porphobilinogen was positive. The diagnosis of acute porphyria was made, and the patient was transferred to Lawson General Hospital.

Previous clinical and laboratory findings were confirmed. The systolic blood pressure remained at 130 to 140 mm. and diastolic at 108 to 110. She lost the ability to phonate and could not talk above a whisper.

Neurological examination revealed widespread flaccid paralysis of the lower motor neuron type. The muscles of the palate moved normally. The vocal cords were completely paralyzed. An electrocardiogram was normal. Examination of the urine was positive for porphobilinogen. Coproporphyrin was observed spectroscopically in the urine on multiple occasions. Uroporphyrin was not found. The color of the urine varied from normal to dark wine color. Total plasma protein, albumin-globulin ratio, and the blood count were normal.

She had recurrent bouts of bilateral flank pain, anorexia, and abdominal cramps, which were usually accompanied by the excretion of dark urine. Her cough was weak. She suffered several disturbing episodes of cough and dyspnea, associated with the aspiration of mucus, which were relieved only by a motor-driven suction apparatus. She required constant vigil by special nurses because she could not call out, nor could she control her arms enough to ring a bedside bell. During the early part of her hospitalization she took food and fluid poorly because of dysphagia. Her diet was augmented by intravenous fluids and parenteral vitamin concentrates. She was fitted with braces for the extremities and a special wheel chair was devised. Amenorrhea has been present since January. During June and July, muscle strength gradually, although incompletely, returned. The muscles of the trunk, shoulders, and pelvic girdle became stronger, but there was little improvement in the small muscles of the hands. The voice returned to a hoarse whisper; appetite, vigor, and spirits became much better. The patient was transferred to a veterans' facility near her home.

A diagnosis of acute porphyria was made and substantiated.

Case 4. A private in the Army Air Forces ground crew, aged eighteen, white, with three months of service, was admitted to Lawson General Hospital, December 19, 1945. His chief complaints were "spells," weakness, and "passing out." The patient's history revealed that he had had pain in his back and flanks since early childhood. A doctor had stated that he had "kidney trouble" of some type. He suffered pneumonia at the age of eleven years and had had enuresis since early childhood. The patient, however, stated that he never recalled passing any dark colored urine. However, he was not a good witness and his statements were vague. From the age of twelve, he suffered recurrent abdominal cramps of sufficient intensity to immobilize him in a flexed position. At the age of fifteen, he began to have vague fainting spells beginning with hot and cold sensations followed by dizziness and unconsciousness. They had not been accompanied by convulsions, biting of the tongue, nor loss of control of the bladder. These attacks had occurred from two or three times weekly to every three or four months. The patient quit school in the ninth grade to work as a constructor and mechanic. He did this to help support his family, but he also stated that school was difficult for him and he did not enjoy it. For many years he had been shaky, shy and introverted. He did not enjoy mixing with people and was afraid of the opposite sex. The patient stated that throughout

his life he had had peculiar experiences, had thought he heard footsteps behind him but, upon looking around, no one was there. Also, on occasions he had heard his name called when no one was near. The family history was contributory, in that the father had suffered from stomach trouble for many years, had been wounded in the last war and had been hospitalized frequently. The mother suffered from asthma and had had numerous "nervous breakdowns." But as far as could be determined, there was no family history of epilepsy or mental disease. Two brothers and one sister were in good health.

The military history was short. He stated that he came into the army in September, 1945, but he did not recall the date. He began basic training but said he "couldn't take it" because of headaches and swollen throat. He had always had physical complaint, but the strenuous activity of basic training accentuated his symptoms. Before and after coming into the army, he suffered from episodes of crying, and since being in the army he had had three occasions when he would break down crying, which led to a fainting spell.

The present illness began while en route from Camp Chaffee, Arkansas, to Keesler Field, Mississippi, when he developed headache, malaise, chills, fever and sore throat. He was admitted to the station hospital, where he was treated for severe pharyngitis with sulfa drugs and penicillin. Improvement was rapid and he was discharged in several days from the hospital. Repeated throat cultures were negative. He was readmitted on November 18, 1945, because of persistence of the same symptoms and an additional complaint of unsteadiness on his feet. On this admission, he was found to be ataxic and to walk with a wide gait. There was moderate in-co-ordination of the upper extremities. Further neurologic examination revealed Rhombergism, astereognosis, and absence of the deep reflexes. The patient complained of a burning sensation in the feet which made walking uncomfortable. Deep sensibility, especially vibration, was impaired but superficial sensation was spared. All findings were more pronounced on the left. There was hesitation and blocking of speech.

The general physical examination was normal. An electrocardiogram showed evidence of left axis deviation. Laboratory studies at Keesler Field revealed normal blood and urine, and the spinal fluid pressure was normal. Globulin was negative and total protein was 59 mg. per cent. Only two white blood cells, lymphocytes, were found.

The patient was then transferred to Lawson General Hospital on December 19, 1945. Upon admission, he continued to show ataxia and in-co-ordination, progressive weakness of the legs, and complete loss of deep sensibility. On January 14, the spinal fluid showed 128 mg. per cent total protein, with a gold curve of 3322-100000; globulin was negative and there were 3 lymphocytes. All other laboratory studies were within normal limits.

As the case progressed, further studies were obtained, and an alert ward man stated that he was afraid that the soldier was suffering from a kidney disease because his urine was very dark red. This led to further investigation, and the urine was found to be positive for hema-

toporphyrins. Uroporphyrin and coproporphyrin were negative. Gastrointestinal examination was negative. Throat and stool culture were negative.

Upon admission to the hospital, the patient was mentally somewhat confused. He complained of hearing voices. He showed tremor of the face and hands, had feelings of insecurity, and manifested evidence of fear. Because of some of his reactions, it was thought that he might be suffering from an acute schizophrenic reaction, and confinement on a closed ward was felt to be advisable. After about a week, the period of confusion and incoherence gradually subsided, and he was released to the open ward. His mental reaction was apparently acute, and presented a crescendo and diminuendo pattern. The dark urine was discovered at the height of the psychotic episode and at no other time. Porphyrins in the urine have subsequently remained negative.

Comment

Two cases of infectious polyneuritis and two cases of neuritis secondary to porphyria have been presented. With respect to the neuritis, the two forms are essentially identical, but there are otherwise certain fundamental and distinct differences.

Infectious polyneuritis, on the one hand, probably results from a virus infection. It follows, after some delay, acute upper respiratory infection. It occurs in an otherwise healthy individual and may be sporadic or epidemic. The neurologic signs are referable to both the sensory and motor peripheral nervous systems. There are few general systemic manifestations. Hereditary and familial factors are absent. The disease is self-limiting and prognosis is good. Complete recovery may be expected in 75 or 80 per cent of cases. Albuminocytologic disassociation in the spinal fluid is common but is not always present and porphyrins in the urine are invariably absent.

Porphyria, on the other hand, is a familial hereditary disease, resulting in the production and secretion of abnormal porphyrins. There is a long-standing family and personal history referable to the gastrointestinal and nervous systems. There are ill-defined and unexplained episodes of nervousness, irritability, insomnia, transitory blindness, abdominal cramps, and constipation. The neurologic signs are referable almost exclusively to the peripheral motor nervous system; however, some cases may show sensory deficits. Mental symptoms, such as organic delirium, depressions, disturbances of mental content, may be prominent during an acute episode. In the spinal fluid, the albuminocytologic disassociation is seldom noted, but occasionally does

appear. Prognosis is grave, and 80 per cent of those affected are expected to terminate fatally.

Other conditions to be differentiated from both diseases are hysteria, poliomyelitis, multiple sclerosis, progressive atrophy, periodic family paralysis, diphtheritic polyneuritis, tic paralysis, serum paralysis and parotitic paralysis.

In discussing the four cases which have been presented, we have the first two which showed fairly clearly the Guillain-Barré syndrome with the classical albuminocytologic disassociation. The third case was unequivocally an acute porphyria with positive clinical and laboratory proof.

In the fourth case, the diagnosis of porphyria was made for the following reasons: The family and previous personal histories were filled with psychogenic manifestations of the type described by Roth.¹⁴ From the history of recurrent colic, the sudden onset of unexplained neuritis and psychosis, and the fact that at the height of symptoms the urine was wine-colored and contained abnormal quantities of hematoporphyrins, it is felt that a diagnosis of porphyria, though not absolutely proved, was undoubtedly justified because of strong presumptive evidence.

Summary

In conjunction with a brief review of the literature, two cases of infectious polyneuritis and two cases of porphyria were presented. They have been differentiated clinically. A diagnosis was made in the fourth case on the basis of clinical manifestations, in spite of the fact that absolute laboratory evidence was lacking.

It is felt that in instances of multiple neuritis, porphyria should be kept in mind and carefully differentiated from other forms of neuritis, espe-

cially the Guillain-Barré type, because of the ultimate serious prognosis in porphyria. A diagnosis of porphyria in the absence of excreted porphyrins may be made with reasonable accuracy from clinical signs and symptoms.

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THE PRESENT SOUTHERN MINNESOTA MEDICAL ASSOCIATION

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grams too elaborate to serve the purpose for which the organization had been formed. It was also apparent that, to some extent, it was duplicating the functions of other organizations, such as the state medical association and the tri-state association. The trend of thought among the members was in favor of smaller and more simple meetings, such as those of more recent years, since such meetings permit closer association of the members and more individual participation in discussion.

The primary object of the organization has been improvement of the practice of medicine through dissemination of medical knowledge. In this, it has been eminently successful. Of equal importance, although perhaps intangible, has been the inspiration members have derived from acquaintance with others whose problems and aspirations are identical with their own. I think that all old members will agree that the association has been invaluable in furthering this acquaintance and fellowship.

INDUSTRIAL INTEGRATION

ALBERT E. RITT, M.D.

Saint Paul, Minnesota

THOSE of us engaged in a part-time or full-time industrial program, during the war, and because of it, were placed in unusual and strained positions. As a result we were forced to "streamline" many of our routine industrial procedures. It was expedient and extremely workable to place much of the preplacement physical examination in the hands of a competent nursing staff. This, when properly supervised, resulted in a program that was satisfactory, particularly in view of the demands made by industry for an ever-increasing rate of employment. Inasmuch as the rate of "hired-to-terminated" is still high, our "streamlined" program is still much in vogue.

The completeness of a physical examination need not be judged by the amount of time a medical examiner spends with the applicant for a job. It makes little difference who asks the questions, be it doctor, nurse, social worker, or clerk, provided the information gleaned is negative. In cases where the information is of a positive nature, it then becomes the duty of trained personnel to determine the cause and ultimate effect on industry, if said individual becomes placed in industry. Suppose, for example, the applicant states in his application blank that he is short of breath. It then becomes the duty of the interrogator or the medical examiner to determine whether this is due to some peculiarity of anatomy, i.e., hunchback with a marked scoliosis; congenital or acquired cardiac pathology, e.g., rheumatic heart in a young individual, or heart muscle failure due to arteriosclerosis in an older individual; metabolic, such as one might find in a condition of overweight or hyperthyroidism; infectious, such as tuberculosis of the lungs; or, nutritional or emotional fatigue due to faulty dietary habits, shock, or overwork.

What we, as medical examiners, must attempt to do are the basic, indispensable procedures. These programs should not be intended to reject the handicapped or submarginal worker; rather, to suit the worker to his most productive job in industry and to minimize the defects that the worker will attribute to industry when this tremendous program once begins to be dis-

mantled. It then becomes the duty of the industrial physician and surgeon to learn to safeguard the worker in industry from machine and material hazards; to supervise environmental working conditions; to conserve health and preserve workability of the employe while at work; to restore speedily and properly the injured worker to his former earning capacity; and to be a sympathetic yet unbiased appraiser of the amount of an industrial disability, being neither for the employer nor against the employe. In this position, the surgeon becomes a sort of liaison officer between the worker and his job, and thereby attempts to attain 100 per cent efficiency with a minimum amount of risk and time lost.

It is particularly advisable at this time when the relationship between the so-called "plant doctor" and the injured employe is more than ever likely to be strained, to redouble the effort to bring the worker, management and the doctor closer together. In order better to accomplish this, it is the duty of the medical department to strive to foster that feeling of confidence between the staff and the worker to such a degree that there will be no doubt in the mind of the worker that nothing is left undone to speed the progress of his return to his former earning capacity. As a further aid in this direction, it is the duty of the industrial organization to provide a competent and well-trained medical and nursing staff, one that becomes known for its ability to carry out with dispatch the duties for which it has been created. To this end, also, there must be sponsored a much closer co-ordination between the industrial and the private physician. It is fully realized that a system in industry can never be devised to supplant the duty of the private physician. No matter how much industry attempts to give the worker, it will be accused of cutting corners or being incomplete. Before this can anywhere near be accomplished, the worker must divorce from his mind the idea of the "plant doctor" as a disinterested physician. The worker must be made to feel that the physician has his interests at heart—that it is the worker who is the backbone of the organization.

Preplacement examinations are made to facili-

tate orientation and advancement of the worker in accordance with his own physical and mental status; to acquaint him with his own physical shortcomings; to guide him in improving and maintaining good health; to safeguard the health and safety of his associates; to discover and to control unhealthful exposure; and to assist in directing the below-par or sick individual into the hands of conscientious medical assistance. As such, the examination must be accurate in appraisal, unprejudiced in evaluation, and personal in principle. The question naturally arises as to the ability of the average worker to select a physician either to examine him preparatory to work or to treat his industrial ills. True, the worker has unlimited confidence in the physician of his own choosing, and if he can only be made to appreciate the effort behind the so-called "plant doctor," his familiarity with the operation of the plant and materials involved, and the frequency with which he sees the same or similar situations repeated, he then, and then only, can begin to appreciate that perhaps the "plant doctor" is, by virtue of all this, somewhat better equipped to treat and handle industrial ills. Further, the industrial physical examination is not intended to be compared with the examination given in private practice. Each has its purpose. The worker must also understand that in industry he has the right of appeal to his own physician. This should be encouraged rather than denied.

When one considers that maladjustment in industry ranks along with accidents and discordant interpersonal relationships in creating absenteeism, inefficient work, and low morale, it is easier to understand why management might do well to insist on proper placement in industry. This fact takes on added importance when one further considers that the average man loses 0.6 day per annum from occupational causes as against 8.8 days per annum from non-occupational causes. Multiplying this figure by upward of fifty million people employed, one readily arrives at the staggering figure of lost production and lost time. In 1942 nearly four billion dollars were spent because of illness and disability. This figure was slightly less than 4 per cent of the total national income.

In setting up a physical examination program with all of its restriction, industry is confronted with four possible situations.

1. There are a sufficiently large number of employees seeking employment so that industry

may be selective, selecting from only the comparatively small percentage of physically perfect applicants.

2. Industry needs manpower to the point of hiring some one for the job, with little regard for defects.

3. Industry may try to be ultra-efficient and set up a physical replacement examination that loses itself in a multiplicity of wasted effort and motions.

4. Industry may try to be practical, yet effective, in uncovering defects of body and mind so that neither the employe nor the employer is penalized.

Obviously, Group 1 is neither feasible nor practical, nor is it a sign of effective preplacement interviewing. Yet unless the industrial commissions and industry get together it is that group to which industry will turn in an attempt to protect itself. In so doing, society will bear the burden of unemployment and employment costs, and this again in turn will be reflected in terms of higher merchandise prices paid by the consumer.

Likewise, Group 2 is far from the answer; and yet there are individuals in this group who can be suited to industry.

Group 3 takes on the duties of "Mr. Citizen's private physician, and as such should not come under the scope of industrial or preventive medicine.

Group 4 then becomes the logical alternative. Even here, one must learn to discriminate between the prospective employe (the applicant) and the one already employed. It is the industrial physician's job to do those things listed elsewhere in this paper. Proper preplacement interviewing by trained workers therefore bridges one of the large gaps in the industrial medical program.

Mantoux testing is valueless unless correlated with an x-ray examination (approximately 60 per cent of the adult population is Mantoux positive). Wassermann testing is of value in bringing to the fore the case of syphilis that is unknown to the individual. It protects neither the individual tested nor the employer and unless repeated may lull the patient into a false sense of security.

In the light of the above there are certain functions that are *musts* from the physician's standpoint. He must evaluate:

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CLINICAL-PATHOLOGICAL CONFERENCE

EPITHELIAL NEOPLASMS OF THE APPENDIX

ARTHUR H. WELLS, M.D. and HAROLD H. JOFFE, M.D.
Duluth, Minnesota

DR. A. H. WELLS: We wish to present briefly four cases of epithelial neoplasms of the appendix and discuss the associated terms of carcinoid, mucoid carcinoma, adenocarcinoma, adenoma, pseudomyxoma peritonei, and mucocele of the appendix.

Case Reports—Clinical Aspects

DR. S. W. ARHELGER: (Case 37141) This eighty-three-year-old retired housewife had been suffering with pain about the umbilicus of two days' duration. The pain moved to the hypogastrium and later became constantly severe and localized in the right lower quadrant. She had vomited greenish material once and had noticed mild constipation. Her past history included hospitalization ten years ago for longstanding severe hypertensive cardiovascular renal disease and toxic nodular goiter. Her blood pressure at that time was 224/122. At the time of the last admission it was 180/100; pulse, 120; respirations, 14; and temperature, 100.4° F. There was severe tenderness and rebound tenderness with moderate muscular spasm in the right lower quadrant. She also had percussible enlargement of the heart to the left and a systolic murmur, which was maximum at the apex and transmitted to the left axilla, but no pulmonary rales. The white blood cell count was 12,700 with 74 per cent neutrophils. Her blood urea and creatinine and urinalysis were essentially normal. An emergency appendectomy was followed by an uneventful convalescence. No further operation was considered advisable.

DR. L. L. MERRIAM: (Case 3038) This sixty-eight-year-old housewife claimed some abdominal discomfort since childhood. She had been admitted to the hospital one year before her death with blood in her stools, at which time small ulcers in the rectum were described as the source of the blood. Eight weeks before her last admission and three months before her death, she had an attack of abdominal cramps and diarrhea. She noticed loss of weight, poor appetite, abdominal "bloating," and belching. On admission, 4,750 c.c. of ascitic fluid was removed from her distended abdomen. Carcinoma cells were found in this fluid. She became gradually weaker during her last two months.

DR. W. N. GRAVES: (Case 26912) This thirty-seven-year-old forester suffered from pain in the right side of the abdomen for twenty-four hours. It began at the time of a long auto ride over a rough road. The

pain was aggravated by walking, and his abdomen became sore. Physical examination revealed muscular spasm and tenderness in the right lower quadrant of

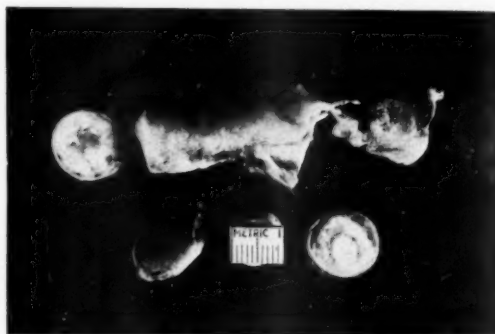


Fig. 1. Serosal and cut surfaces of an appendix with mucoid carcinoma.

the abdomen, and tenderness to the right on rectal examination. He had a white blood cell count of 15,000 with 70 per cent neutrophils and a temperature of 98.4° F. An appendectomy was followed by a rapid return to normal activity.

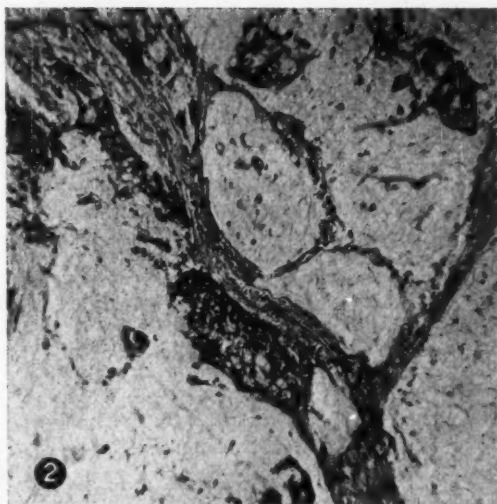
DR. A. N. COLLINS: (Case 37213) This twenty-one-year-old steelworker had a steady dull pain in the lower right quadrant of the abdomen for forty-eight hours. Physical examination revealed mild tenderness in the same area of the abdomen, and his white blood cell count was 13,850. An emergency appendectomy was followed by a rapid convalescence.

Pathological Aspects

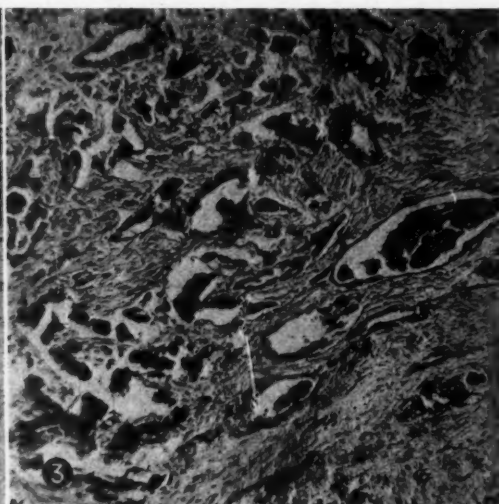
DR. A. H. WELLS: (Case 37141) This appendix (Fig. 1) measured 7 cm. long and from 1 to 1.5 cm. in diameter. There was a perforation, 4 mm. in diameter, at the distal end at a localized site of suppuration. The remainder of the lumen was filled with mucus-forming anaplastic epithelial cells (Fig. 2) which invaded the muscularis. At the proximal end the mucosal glands had a papillary adenomatous alteration without invasive properties.

(Case 3038) There was a rather highly anaplastic adenocarcinomatous infiltration (Fig. 3) of the walls of a swollen (1 cm. in diameter, 6 cm. in length) appendix, with an obliterated lumen and an irregular distribution of muscle fibers suggestive of a congenital

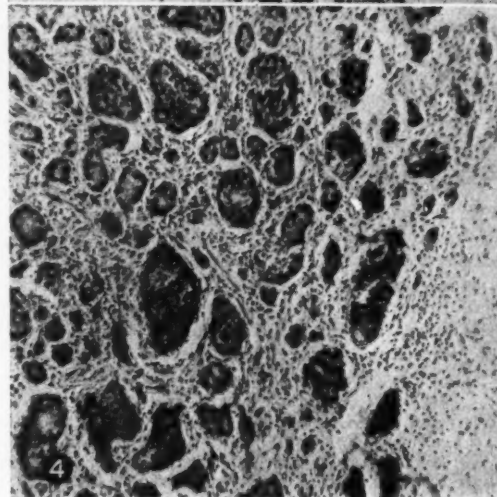
From the Department of Pathology, St. Luke's Hospital, Duluth, Minnesota, Arthur H. Wells, M.D., Pathologist. Clerical Assistance by Miss Faith Gugler.



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Fig. 2. Typical mucoid carcinoma of the appendix.

Fig. 4. Typical carcinoid of the appendix.

Fig. 3. Highly anaplastic adenocarcinoma of the appendix.

Fig. 5. Papillary adenoma of the appendix.

anomaly of the appendix. The malignancy had extended to regional retroperitoneal lymph nodes and both peritoneal and pleural surfaces. Terminally, she developed intestinal obstruction due to malignant adhesions about loops of small intestines.

(Case 26912) This man's appendix had small clumps of highly hyperchromatic, uniformly small, epithelial cells (Fig. 4) with both simple glandular arrangements and small clumps with palisaded peripheral cells. These carcinoid cells were located primarily in the obliterated lumen of the distal 1 cm. of the appendix, and a few cells had extended into the muscularis. In addition, the proximal appendix had a very mild neutrophilic infiltration of all layers.

(Case 37213) This appendix, 7 cm. in length and

0.7 cm. in diameter, had no unusual gross appearance. However, histologic sections from near the middle revealed a small area of mucosa with a slightly papillary adenomatous proliferation of the mucosal glands, of neoplastic proportions without malignant invasion (Fig. 5). There was no inflammatory change.

In conclusion, these four cases are illustrative of different forms of epithelial neoplasms of the appendix: mucoid carcinoma, adenocarcinoma, carcinoid, and adenoma.

Carcinoid

Although there is no general agreement as to classification of epithelial malignancies of the appendix, it is obvious that carcinoids (enterochromaffin, basi-granular,

Nicolas, Kultschitzky, Schmidt and Ciaccio cell tumors) should be set in a class by themselves. They have been described as often as one in every 200 appendectomies⁴ and have been studied in great detail, so that the practical aspects of their nature are well known. Carcinoids are found 50 per cent of the time in the appendix, and the remainder in the ileum, jejunum, stomach, gall-bladder, duodenum, Meckel's diverticulum, cecum, colon, and rectum. They most likely develop from the Kultschitzky cells found sparsely scattered in the bases of Lieberkuhn's crypts along the intestinal tract. The physiologic function of these cells is not settled. It is significant that approximately 25 per cent of the recorded^{1,2,11} carcinoids of the small intestines metastasize, and some are the cause of death due to their malignant nature. Nearly all of those found in the stomach and colon tend to metastasize. The same tumor in the appendix is much less likely to extend beyond this organ. Less than twenty had been reported as metastatic by 1942.^{9,10} Even when it does reach a regional lymph node, it is very likely to remain there for many years without harm to the patient.⁸ Consequently, for all practical purposes, the surgeon can consider carcinoids of the appendix as essentially benign. However, if recognized at the time of the operation, local extensions should be sought for and removed.⁵ One should avoid postoperative x-ray therapy and mental disturbances of the patient concerning "cancer."

Adenocarcinoma

Other types of carcinoma of the appendix represent only about 10 per cent of the total malignancies of this organ and are much more serious than the relatively common carcinoids. They are more likely to occur in the fifth and sixth decades rather than in the third, as is the case in carcinoids of the appendix.⁶ Unquestionable examples of this smaller group, which is sometimes called adenocarcinoma, are rare and should be reported in the medical literature for future group study, reference, and clarification of the subject. Uihlein and McDonald¹⁴ divide their seventeen cases (from thirty-one years of appendectomies at the Mayo Clinic) into "cystic" and "colonic" types. Although the Lieberkuhn's glands of the appendix undoubtedly have the same potentialities for varieties of epithelial malignancies as the same glands in the colon and rectum, there appears to be a decidedly increased tendency toward mucoid carcinoma in the appendix. These malignant cells form mucin and pseudomucin (chemical and tinctorial variants of mucus).¹⁰ The extension of this malignancy to peritoneal surfaces may lead to pseudomyxoma peritonei or "jelly belly." The abdominal cavity may become filled with gelatinous material.

Benign Epithelial Lesions

Simple mucocoeles of the appendix most often result from an inflammatory process obliterating the proximal lumen. Subsequent secretion of mucus by lining epithelial cells in the distal lumen may in time rupture the atrophic appendix walls and produce pseudomyxoma peritonei.¹³ The condition can kill as the result of intestinal obstruction.⁹ Whether or not this non-neo-

plastic lesion (mucocoele) becomes malignant, as has been theorized,^{15,16} needs further confirmation. Furthermore, it may be very difficult to rule out mucoid carcinoma in an apparent case of ruptured mucocoele. Pseudomyxoma peritonei is most often due to mucin secreting, benign or malignant ovarian cysts.

It is thought that some of the adenocarcinomas have their origin in benign papillary adenomas of the appendix.¹⁴ There is much proof of this relationship in the colon. Furthermore, the tendency toward multiple papillary areas in the colon makes it imperative that x-ray studies of the colon be performed in patients with adenomas in their appendix, such as in our Case 37213. Benign papillary adenomas may form mucus and distend the appendiceal lumen with this product to the point of rupture. Their differentiation from a low-grade mucoid carcinoma may be extremely difficult, if not impossible.

Clinical Manifestations

"It is futile to attempt to make a preoperative diagnosis" of appendiceal tumors.¹² The odds favoring common lesions with the same manifestations are top great. In a review of ninety-six cases⁷ of carcinoma of the appendix, 83 per cent of the patients suffered from symptoms of appendicitis and 28 per cent had symptoms for one year or more. In another report of twenty-eight patients¹⁰ with appendiceal cancer, the chief complaint was pain in the right lower quadrant of the abdomen. The associated appendicitis so frequently found will of course produce all of the signs and symptoms of this disease. Rarely a tumor mass or blood in the stool may be evident.¹⁴ A chronic recurring ill-defined pain in the appendiceal region is a frequently mentioned symptom of carcinoid. In many cases, this lesion is entirely clinically quiescent and is described as an incidental finding in laparotomies performed for other lesions.

Summary

1. We have presented four case studies of patients with different epithelial neoplasms of the appendix, including mucoid carcinoma, adenocarcinoma, carcinoid, and papillary adenoma.
2. A very brief review of the nature and interrelationships of these neoplasms, and of mucocoele and pseudomyxoma peritonei, is given.

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(Continued on Page 223)

◆ HISTORY OF MEDICINE IN MINNESOTA ◆

NOTES ON THE HISTORY OF MEDICINE IN FILLMORE COUNTY PRIOR TO 1900

By NORA H. GUTHREY
Mayo Clinic
Rochester, Minnesota

(Continued from January issue)

A. O. Heiberg, who was born at Christiania (Oslo), Norway, in November, 1855, received his primary education at Quam's Latin School in that city and his more advanced schooling at the Latin School at Trondjem. He was preparing to enter the Fredericiana University to study medicine, but changed his plan and instead took a course of two years at the Stenkjaer Apothecary under Mr. A. J. Hoegh.

In April, 1873, Mr. Heiberg came to America and to southern Minnesota, which was to be his permanent home. In his first year he worked for a druggist, Mr. Pilzer, in Winona, and then settled in Rushford, Fillmore County, where he was associated as a pharmacist in different drugstores, first with K. Olson for four years, subsequently with Elling P. Kierland, a pioneer medical practitioner, and finally with A. E. Hazard, with whom he bought the Corner Drug Store, which the two men operated until the partnership was dissolved by mutual consent in 1902.

On August 30, 1887, in Rushford, Mr. Heiberg was married to Bertha Anderson; five children were born to this marriage.

In 1889, returning to his original intention of becoming a practicing physician, A. O. Heiberg entered Rush Medical College, in Chicago, where he spent two years before going on to the Jefferson Medical College, in Philadelphia, from which he was graduated in 1893. Again in Rushford, the possessor of state medical license No. 346, under the act of 1887, he entered on ten years which brought him deservedly a large and successful medical practice, in which his scientific skill, together with his cheerful manner and sympathetic understanding, won him confidence and esteem. Among his professional affiliations were memberships in the Winona County Medical Society and the Southern Minnesota Medical Association.

When, in 1903, symptoms of bulbar palsy appeared, and skilled physicians in the East told Dr. Heiberg that the months of his life were numbered, he decided to move his family to Northfield, Minnesota, where the children could obtain excellent educational advantages, and he made the change during the early summer. He died in Northfield on March 18, 1904, survived by Mrs. Heiberg and the five children.

About **Ole T. Hoftoe**, little information has come to light except that he was born in New London, Kandiyohi County, Minnesota, in 1854, was graduated from Rush Medical College on February 17, 1885, and within a month,

HISTORY OF MEDICINE IN MINNESOTA

on March 13, received state certificate No. 1012 (R) to practice medicine in Minnesota. For a year or so, in 1885 and 1886, he was resident in the village of Fountain, Fillmore County, and in the next year in the larger, near-by town of Lanesboro. In the following year it appears that he had moved to Dakota Territory (North Dakota) where, on March 30, 1888, Dr. O. T. Hofte [sic] was registered as being in practice in Abercrombie, Richland County, and there, according to a gazetteer and business directory, he remained well into the nineties. After an undetermined period of time, but certainly prior to 1907, Dr. Hofte returned to his native place of New London. After 1909 his name did not appear in the official medical directory.

Robert Hoyt, who became one of the earliest of physicians in Fillmore County, was born at Hesper, Iowa. It is said that soon after his graduation in medicine, probably in 1859 or 1860, he settled in the village of Lenora, and there for two years was a confrere of Dr. James M. Wheat, who had come in 1856. From Lenora he moved to Beloit, Wisconsin, the home of his wife's parents, where he followed his profession for many years. In an early history of Fillmore County he was mentioned, it is believed erroneously, as a charter member of the Fillmore County Medical Society, which was founded in 1866.

Robert W. Hoyt, almost certainly a relative of Dr. Robert Hoyt, the pioneer physician already mentioned, was born at New Haven, Addison County, Vermont, on February 14, 1852. When he was eight years old he moved with his parents to Fillmore County, Minnesota, where he spent his boyhood and attended the local schools. In 1875 he was graduated from Rush Medical College of Chicago and immediately afterward began to practice medicine in the community of Lenora. It is said that in the next year he moved to Walnut Grove, Redwood County, where he remained for a considerable number of years, into the eighties. In June, 1880, he was married to Myra E. Tester, of New Lisbon, Wisconsin. By 1890, like Dr. Robert Hoyt before him, Dr. Robert W. Hoyt had moved to Wisconsin, the home of his wife's people, and was established in medical practice in New Lisbon, where he still was in 1912; his name did not thereafter appear in the medical directories.

Dr. Huffman, apparently a medical nomad, was in Preston early in 1863, exhibiting, according to the *Preston Republican*, "much skill in the way of restoring loss of sight and hearing. Those afflicted with diseases of the eye and ear would do well to call at the Minnesota House and consult him." Another clue to this practitioner lies in the statement that Dr. Huffman, an eye and ear specialist from St. Louis, practiced in Austin, Mower County, for a few months in 1863.

Thomas W. Hunt, a graduate of the Jefferson Medical College in 1894, was licensed in Minnesota on July 10, 1894, receiving certificate No. 456, under the "Act to Regulate the Practice of Medicine in the State of Minnesota" as approved in 1887. He was then a resident of Douglas County. Not long afterward he presented his license in Fillmore County, and in the issue of 1896-1897 of a state gazetteer and business directory he was listed as being in practice in Lanesboro. In the official register of physicians of Minnesota of 1883-1909, his name appeared without post office address. His name was not included in the first (1907) issue of the directory of the American Medical Association.

Johan Christian Hvoslef (sometimes seen Hooslef), who became one of the distinguished citizens and physicians of Fillmore County, was born at Fjorde, Søndfjord, Norway, on August 24, 1839, a member of a family which gave several outstanding men to the political and professional history of Norway.

Well-trained in academic subjects at the Latin School and in general sciences at the University of Norway, both at Christiania, Johan C. Hvoslef came to America in 1872 and continued his studies at Rush Medical College, from which he was graduated in 1876. In the same year he was married to Karen Anderson of Wisconsin and came with his wife to Lanesboro, then a village of about 1500 people, where he lived and continuously practiced his profession until his death on October 11, 1920. Dr. and Mrs. Hvoslef had one child, a daughter, who died in Lanesboro at the age of six years. Dr. Hvoslef was survived by his wife and his sister, Mrs. Thorvold Klavane, of Christiania. A brother, Nils C. V. L. Hvoslef, a state official of Trondjem, Norway, had died earlier.

Dr. Hvoslef's life in Lanesboro was that of the country doctor, able, faithful, overworked, unsung. It is a matter of record that in 1882, working with the State Board of Health, Dr. Hvoslef as health officer dealt efficiently with the local outbreak of smallpox. Under the Medical Practice Act of 1883 he received state certificate No. 466 (R) on December 28, 1883, which he filed in Fillmore County on October 28, 1889. He was a member of the official local and state medical societies and of the American Medical Association.

A quiet, modest, retiring man of distinguished ability, Dr. Hvoslef was not so well known in the state as he should have been. Besides being a skilled physician and surgeon who served his community well, he was a naturalist of distinction. Thomas S. Roberts, M.D., in his masterly work, *The Birds of Minnesota*, recognized Dr. Hvoslef's ability as a physician and paid tribute to him as a naturalist:

Perhaps no one man did so much to develop a knowledge of the bird-life of a single locality in the state as did Dr. Johan C. Hvoslef. . . . He was a well-trained man and, possessing an intense interest in natural history and a methodical and painstaking type of mind, he was well fitted to make an intelligent, careful study of the region in which he passed the greater part of his life. Throughout the entire fifty-four years, he kept a detailed diary in which he recorded all his observations, covering the whole field of natural history, though birds and plants were his first interests. There are fifty-four volumes of these journals, with three additional general notebooks. The year following Dr. Hvoslef's death, Mrs. Hvoslef very generously presented, in complete form, this life-work of her husband to the Museum, where it is now one of the most valued possessions. Dr. Hvoslef, during his life, had given to the Museum his collection of bird-skins, numbering some four hundred, and after his death, his wife donated a small collection of birds' eggs, among which were those of the blue-winged warbler, unique specimens for Minnesota.

No part of these diaries have ever been published, but from them were taken the bird-migration records that Dr. Hvoslef sent to the United States Biological Survey at Washington over a series of years, and concerning which Mr. Wells W. Cooke, in one of the Survey bulletins, stated that the information from Lanesboro was the most satisfactory that had been received from any source. There is also on file at the Museum a considerable series of letters from Dr. Hvoslef, relating almost entirely to the bird-life of Minnesota, received by Thomas S. Roberts, M.D., Fellow of the American Ornithologists' Union, Professor of Ornithology and Director of the Museum of Natural History of Minnesota. Dr. Hvoslef's great modesty prevented his publishing at first hand the results of his work. This explains the absence of his name from the Minnesota bibliography. But he generously and freely supplied information to others, and thus he is quoted, second hand in many connections, as authority for original and valuable records. All the records from Lanesboro in this work

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are from Dr. Hvoslef's work. Fortunately he recorded carefully and accurately everything that came under his notice, and the Minnesota bird-students owe no small debt of gratitude to this retiring but accomplished and hard-working man of science.

George E. Jackson for many years a practicing physician of Minnesota, was a graduate of Rush Medical College in 1880, and under the Medical Practice Act of Minnesota of 1883 received state certificate No. 9 (R) on October 11 of that year. He then was living in Fergus Falls, in Otter Tail County. Strangely, it has been impossible thus far to discover more than isolated bits of information concerning this well-qualified physician.

On June 9, 1885, George E. Jackson, M.D., a graduate of Rush on February 20, 1880, registered in Dakota Territory as in practice at Lakota, Nelson County; during his residence in Dakota he was appointed County Superintendent of Health.

Dr. Jackson returned to Minnesota probably in the late nineties, and by 1899 he had settled in Chatfield, Fillmore County; in that year at a meeting of the Southern Minnesota Medical Association in Owatonna, in Steele County, he was elected to membership. Dr. Jackson remained in Chatfield at least into 1912. His name did not appear in the issue for 1914 of the directory of the American Medical Association.

Charles H. Jacobson was born in Norway on May 17, 1856, received his early education in the schools of his native place and, in 1871, at the age of fifteen years, came to America and settled in southern Minnesota. After working for five years in the drug store of Albert Weiser in Preston, he decided on the study of medicine and entered the Bennett Eclectic College of Medicine and Surgery, from which he received his degree of doctor of medicine in March, 1879. Immediately after his graduation, Dr. Jacobson improved his medical knowledge by taking a special course at the Chicago College of Ophthalmology and Otology before returning to establish himself as a physician in Preston. In 1881 and 1882, at least, he was in active practice, and that he used his specialty is evidenced by the following item in the *National Republican* of Preston of December 29, 1881: "Lost by Dr. Jacobson: A myopodiartrotican, used in cases of myopia."

The fact that, subsequent to 1883, Dr. Jacobson's name did not reappear in the state gazetteer which had carried it previously is inconclusive evidence that he had gone elsewhere. It is significant, however, that he was not listed in the official directory of physicians in Minnesota of 1883-1890, nor in the edition next following.

J. Ross Johnson was born on July 18, 1855, at Oak Leaf, Ontario, Canada, the son of Mr. and Mrs. Samuel Johnson, who were farmers. In 1883 he was graduated from the Medical School of McGill University, and shortly afterward came into the Middle West of the United States, to settle in Spring Valley, Minnesota, at the suggestion and request of friends from Canada who already had established themselves in that community. On October 13, 1883, under the new Medical Practice Act of the state he received license No. 150 (R). That he at once identified himself with the medical profession of the state is evidenced by his election to membership in the Minnesota State Medical Society at the annual meeting held at Minneapolis, in Market Hall, on June 19, 1883. At this same meeting, one of his senior colleagues, who had been in Spring Valley since 1871, Dr. Russell L. Moore,

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became third vice president of the association. Dr. Johnson allied himself with the local group of physicians in Fillmore County and, in 1904, on organization of the Houston-Fillmore County Medical Society, became an active member.

J. Ross Johnson was married on August 30, 1882, to Jennie Green, a Canadian, and brought his wife with him to Spring Valley. They had three children, Florence, Charles Harcourt, and Harry H. Johnson. When Mrs. Johnson died in 1894, her body was taken back to Canada for burial. In 1897 Dr. Johnson was married to Martha Banks; there were no children of this marriage.

Dr. Johnson belonged to a family of which two other members who were physicians came into southern Minnesota. His brother, Dr. Charles Harcourt Johnson (1859-1917), newly graduated from McGill University, settled permanently in Austin, Mower County, in 1884. His half-brother, Dr. William Nassau Kendrick (1872-1936), also a graduate of McGill, in 1896, in that year began practice with him in Spring Valley; from 1898 to 1905 Dr. Kendrick was in Austin in partnership with Dr. C. H. Johnson, but in 1905, on the death of Dr. J. Ross Johnson, he returned to Spring Valley to carry on his half-brother's practice.

Dr. J. Ross Johnson is recalled as a fine man and citizen, a physician and surgeon of unusual knowledge and skill, whose favorite diversion was fishing and whose love of horses was a distinguishing quality. In those pre-automobile days, he kept, like many of his confreres, from six to eight excellent driving horses most of the time, and although he drove them hard, he handled them with skill and consideration and gave them the best of care. Only ten days before his death in February, 1905, he drove sixty miles in a cutter.

His son, Dr. C. H. Johnson, has recalled that Dr. Johnson in his heavy and widespread practice used to consult on occasion with his near-by colleague, Dr. Albert Plummer, of Hamilton (later of Racine), and that he was "a great admirer" of Drs. William J. and Charles H. Mayo, who sometimes were called in consultation into the community.

The death of Dr. Johnson on February 27, 1905, at the height of his usefulness, was a sorrow and loss to Fillmore County. Dr. Johnson was survived by his wife, who in 1943 was living in Austin, Texas; by his two sons, Harry H. Johnson, a jeweler of Spring Valley, and Charles H. Johnson, who has been a physician since 1912, in Spring Valley since 1916; and by his daughter Florence (Mrs. Claude W. Rossman, of Minneapolis). Mrs. Rossman's death occurred in the nineteen thirties.

In speaking of his father, Dr. Charles H. Johnson commented on the advances and conveniences in medical practice of later years of which the older man could not know. In his times calories and vitamins were not recognized factors in nutrition, the value of roentgen rays in medicine had not been fully realized, and the sulfa drugs were unknown. "It seems too bad that he was born too soon and died at the age of forty-nine, just a young man."

Henry Jones was born on March 13, 1845, on a farm near Nashville, Ohio, the son of William Jones, who was of Welsh blood and a native of Steubenville, Ohio, and Sarah Collier Jones. His mother was descended from an English family who had come to America early in the eighteenth century; her grandfather twice was sent to Congress from Ohio when the state was young. Henry Jones had seven brothers and sisters: William, Sylvester and

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Samuel, Mollie Wright, Sue Rose, Elizabeth Hunter and Evangeline (Mrs. Warner, of Morrison, Illinois, the only member of the family living in 1941).

Henry Jones grew up on his father's farm, receiving his early education in the schools of Nashville. In his nineteenth year he enlisted in Company B of the Sixtieth Ohio Regiment of Volunteer Infantry and with it served at the front until he was wounded at the battle of Petersburg; on his release, after ten months in a hospital in Philadelphia, he received his honorable discharge from the army and returned home. Before continuing his formal education, he worked for a time, loading lumber on the first trains to pass through Ohio. During 1866 and 1867 he was a student at the Franklin Institute in Prophetstown, Illinois, and for a year studied medicine under Dr. J. H. Mosher of that city in preparation for enrolling at Rush Medical College in 1869. Graduated from Rush in February, 1871, he began his medical career in the village of Granger, Bristol Township, Fillmore County, Minnesota, but in September of the following year, because of superior financial opportunity, he moved to the larger place of Preston, in Preston Township. He was succeeded in Granger by Dr. Don J. Lathrop, who arrived in the spring of 1872. In Preston, Dr. Jones remained in active practice for forty-six years, during which he numbered among his fellow physicians Lafayette Redmon, James H. Phillips, John A. Ross, Lyman Viall and George A. Love, as well as many others who came and sooner or later passed on. And during these years, like all the other physicians of the period and region, he met the discomforts and hazards of carrying on a country practice in all weathers and over all roads. Excerpts from old records and newsheets give glimpses of him at work: assisting Dr. Ross "in the presence of Mr. Love, a medical student," to perform an autopsy on the body of a child who had died from cerebrospinal meningitis; refusing, after he had been called on a case which proved to be one of smallpox, to see other patients or to appear in public until danger of conveying the disease to others had passed; performing an operation, with Dr. Lathrop, for removal of a ruptured eyeball, under chloroform anesthesia, on an old gentleman who lived near Granger.

On December 24, 1874, Henry Jones was married to Bertha A. Loomis of Preston. The only child of the marriage, Charles Henry, died in infancy; Mrs. Jones died in 1878. Dr. Jones in 1881 was married to Ella Gray of Decorah, Iowa, and to this marriage were born three children: Mabel, who died young; Rodney C., who became a musician, at one period living in Wallace, Idaho, and in later years in Minneapolis; and Millie M. (Mrs. I. Kasten, of Chicago).

In 1882, to meet the conditions of practice of the times, Dr. Jones took up the study of dentistry and thereafter was both dentist and physician, but especially dentist. There were many items in the local newspaper of those years which mentioned his skill and fine equipment or which stated that Dr. Jones, Preston's popular dentist, had just returned from a successful tour and would remain in his home office for about two weeks.

On December 31, 1883, under the new ruling of medical practice in the state, Dr. Jones received certificate No. 668 (R). From 1872 to 1877 his professional card appeared in *Western Progress*, the newspaper of Spring Valley, as well as in the local papers, and his name was listed in Polk's gazetteer almost continuously from the late seventies for many years. From January 6, 1889, to January 6, 1891, he was coroner of Fillmore County.

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President's Letter

Physicians Obligated to Remedy Conditions in State Institutions

THE responsibility for the health of the citizens of Minnesota rests squarely on the shoulders of its physicians, and it is the purpose of every member of the Minnesota State Medical Association to discharge this obligation in an efficient, humanitarian and ethical manner. We take pride in the standards of medical care in rural and urban communities. We are proud of our state program for the control of contagious disease, of our public health activities, of our record in the military service and at home during the war. However, in one field, one in which we find the largest number of patients, conditions exist which are far from desirable. I refer to the mentally ill who inhabit our state institutions and who constitute a profound responsibility of the physicians as well as of other citizens of the state.

More than 50 per cent of hospital beds in Minnesota are occupied by patients who suffer with mental disease. Such patients in the state reach the astonishing total of almost 11,000, and in this number are not included those individuals who are registered in the school for the feeble-minded at Faribault and the epileptic colony at Cambridge. The fact that these individuals represent such a large proportion of the families of the state proves that care of the patients in many instances constitutes a serious social problem.

The publicity which recently has been directed against certain hospitals for patients suffering with mental disease has aroused much adverse criticism. It should reveal the great responsibility which falls on all reliable citizens of this nation. In physical equipment and proportionate size of professional staffs, Minnesota institutions compared favorably with those of most other states twenty years ago, but this condition does not exist today. No longer can we coast along on such an illusion. There is more good fortune than merit in the fact that the institutions of this state escaped the humiliating glare of recent investigations.

A survey of state hospitals conducted in 1939 and 1940 revealed that too few physicians were engaged in caring for patients suffering with mental disease. Specifically, it was learned that in Minnesota there was only one physician for every 435 patients in our state institutions. At this time I believe that the national average is one physician for every 250 patients. The ratio of attendants and ward personnel in 1940 was one for every fifteen patients. The standard approved by the American Psychiatric Association is one physician for every 150 patients and one attendant for every 5.6 patients.

The responsibility for these conditions is not that of the superintendents of the institutions. I am reliably informed that the service which they have rendered, with their limited professional and attendant staffs, has been heroic. This is especially true in Minnesota where problems have been presented to the legislature repeatedly through the Director of Public Institutions, who acts as the intermediary agent of the superintendents of the institutions. Their requests for facilities sufficient to insure standard, adequate care of their patients often have been sidetracked until other demands have been satisfied, and what has been left of the budget has been sufficient to afford only a custodial level of patient care. Minnesota now ranks very low among the states of the nation in per capita expenditure for the mentally ill.

Apparently, the chief interest evinced by our legislature has been in the housing of patients. Undoubtedly, this phase of the problem has been, and is, serious. Today almost 11,000 patients are crowded into space which originally was intended for not more than 8,000. In certain institutions, overcrowding runs as high as 30 per cent and conditions exist which run counter to regulations of the State Fire Marshal as well as those of the State Board of Health. These statements are no doubt unpalatable, and what makes them peculiarly so is the fact that it is impossible to refute them.

In spite of the obvious need for funds for physical equipment, I doubt that this phase of the problem is nearly as serious as that which exists because of lack of other facilities for the care of patients. Measured in terms of human values and in the light of our responsibility to the citizens of the state, we have a great duty. We must provide adequate programs of therapy in order that patients may be returned to productive life. We must use every means to prevent recurrence of illness and to provide facilities for counsel and guidance in order to prevent the development of additional mental disorders in the community.

It is important that conditions pertaining to a form of illness which afflicts half the patients in hospitals of the State of Minnesota should be understood by our legislators. If these patients are to receive adequate medical care, the cost during the next few years will be great. It should be great. It is a justifiable expense. It is an appalling fact that the per capita per day cost in our state institutions barely exceeds one dollar. It is almost

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unbelievable. The standards set up by the American Psychiatric Association are \$5.00 per capita per day for patients who suffer with acute conditions and \$2.50 per capita per day for those who are chronically ill. Evidently, these facts are not well known to our legislators. It is the responsibility of the physicians of the state, as well as of other responsible citizens, to make it known that our goal is adequate treatment and comfortable housing for every patient in our state hospitals for the mentally ill. This must be done without further delay, in order that we may look forward to a decreasing, rather than an ever-increasing, custodial population in our state hospitals.

Louis A. Buie

President, Minnesota State Medical Association

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Dr. Jones was an independent voter, was well read and tolerant. He was a member of the Presbyterian Church; of the Underwood Post No. 122 of the Grand Army of the Republic, and its commander for many terms; of the Independent Order of Odd Fellows and of the Masonic Blue Lodge of Preston, the latter of which he joined on December 17, 1873. An avocation which he made profitable for a number of years was the keeping of bees.

After forty-six years in Preston, "highly esteemed . . . respected for his virtues, attainments and labors," Dr. Jones moved to the town of Bethel, Anoka County, where he practiced medicine six years before retiring to California to make his home. He died in Monrovia on June 30, 1931, from the infirmities of old age. Mrs. Jones survived him, and until her death, on February 3, 1943, at the age of eighty-five years, resided with her daughter, Mrs. Kasten, in Chicago.

About **J. R. Jones** only one note has been gleaned. In an historical atlas of Minnesota, of 1874, of which he was a patron, there appears the entry that J. R. Jones was a physician, was born in Monroe County, New York, came to Minnesota in 1861, and in 1874 (and earlier, obviously) was living in Lanesboro, Fillmore County.

Of the career of **Emma Adeline Keeney** only an outline is presented. Emma Adeline ——— was born in 1876 (the surname is lacking, as is the date of her marriage). She was graduated from the College of Homoeopathic Medicine and Surgery of the University of Minnesota in 1897, and in April of 1898 received her license to practice in the state. There is evidence that she began her professional career in Spring Valley, Fillmore County, and practiced there for possibly a year; in a business directory of 1898-1899 appeared the name of "Mrs. E. A. Keeney" in the list of physicians of the town.

From Spring Valley Dr. Keeney moved to Austin, Mower County, where for a time she was in partnership with Dr. Fannie K. Fiester, who in 1893 had been graduated from the Woman's Medical College of Northwestern University. Evidently desirous of improving her professional knowledge, Dr. Keeney took graduate work, and in 1904 was graduated from the Hering Medical College of Chicago. Presumably she settled soon afterward in Albert Lea, Freeborn County, where she was practicing in 1907. In 1909 she was licensed to practice in the state of Oregon, and into 1914, after which further entry did not appear, she was in active practice in The Dalles.

(To be continued in March issue)

Editorial

CARL B. DRAKE, M.D., *Editor*; GEORGE EARL, M.D., HENRY L. ULRICH, M.D., *Associate Editors*

STREPTOMYCIN

STREPTOMYCIN is now available to the profession, and reports indicate its great value in a limited number of infections. Its high cost will necessarily limit its use. The fact, too, that various strains of the same bacterial species differ widely in their sensitivity to streptomycin, and that its absorption by individuals differs so greatly, has made evaluation of its usefulness difficult.

Streptomycin has been found of value in the treatment of a number of infections due to both Gram-negative and Gram-positive bacteria. Perhaps the most important are urinary tract infections due to Gram-negative organisms, infections due to certain strains of *Escherichia coli*, *Proteus vulgaris*, and *Aerobacter aerogenes*, as well as *Salmonella pneumonia* due to Friedlander's bacillus, and *Hemophilus influenzae* infections and tularemia.

Streptomycin is administered in much the same fashion as penicillin. However, it is more likely to produce toxic symptoms than is penicillin. In larger doses it sometimes affects the eighth nerve, producing deafness or dizziness or both, which, though usually temporary if the drug is withdrawn, may become permanent. Urticaria is not uncommon as a side effect.

The new antibiotic can be given orally, intramuscularly, intravenously or intrathecally. The intramuscular route is preferable, with 1,000,000 to 3,000,000 units being given daily. Recently the metric system has been adopted in defining dosage, 1 mg. of streptomycin being equal to about 1,000 units. Solutions containing 0.1 to 0.2 gram (100,000 to 200,000 units) per c.c. may be used intramuscularly, but for intravenous administration the twenty-four hour dosage of 1,000,000 to 3,000,000 units should be diluted in 1 or 2 liters of isotonic salt solution. Single injections of as much as 0.1 gram (100,000 units) have been given intrathecally in 5 to 10 c.c. of normal saline. Concentrations of the drug as high as 50,000 units in 1 c.c. of isotonic saline solution have been used for insufflation by a nebulizer for bronchiectasis, without evidence of irritation.

The routine use of streptomycin for urinary tract infection has been disappointing, according to Nichols and Herrell.² When the urinary infection was due to *Proteus ammoniae* or *Aerobacter aerogenes*, the best results were obtained. It seems important that the urine be alkaline and that urinary stasis be overcome before favorable results can be expected.

If treated early in the disease, tularemia seems to respond well to streptomycin.¹ Influenzal meningitis is another infection which responds well to this new antibiotic. Experience with its use in tuberculosis is thus far insufficient to establish its value in this disease.

A point that deserves consideration is that streptomycin should be given in effective dosage from the start, for it has been found that some strains of bacteria develop resistance to the drug.

Experience with this new antibiotic has been sufficient to prove it a valuable addition to the relatively short list of specific drugs we possess.

1. Howe, Calderon, et al.: Streptomycin treatment in tularemia. *J.A.M.A.*, 132:195, (Sept. 28) 1946.
2. Nichols, Donald R., and Herrell, Wallace E.: Streptomycin. *J.A.M.A.*, 132:200, (Sept. 28) 1946.

FLUIDS IN HEART DISEASE

"SALT-FREE" diets and restriction of fluids in the presence of edema have been in vogue for a number of years. Only recently has it been learned that it is the sodium, whether it be in sodium chloride or sodium bicarbonate, which should be restricted in the presence of edema, from whatever cause, and that limitation of fluids is wrong.

According to theory, the normal interchange of fluid between the circulation and the body tissues depends on hydrostatic pressure and osmosis. With the pressure in the precapillary vessels greater than the osmotic pressure in them, fluid escapes into the tissues. Since pressure in the postcapillary vessels is less than that in the precapillary vessels and is also less than the osmotic pressure in the postcapillary vessels, there is a withdrawal of fluids from the tissues. A lowering of the plasma contents of the blood would

result, according to this theory, in a greater diapedesis of fluid from the precapillary vessels into the tissue spaces, and would also cause a lessened absorption of fluid from these spaces into the postcapillary vessels, as a result of the lessened osmotic pressure-effect of the plasma.

In the presence of cardiac decompensation, with diminished cardiac output and increased venous pressure in the postcapillary vessels as well as in the rest of the venous system, the return of fluid to the postcapillary vessels from edematous tissue spaces is hindered. Edema fluid contains salt, among other elements, corresponding to the blood content. Along with venous congestion, then, the kidney output is diminished in quantity, and its sodium chloride content is lowered.

Theoretically then, the reduction of edema should be favored by any factor which improves circulation and relieves venous congestion, by the restriction of salt in the diet and thus in the circulation, and by diuresis, whether it be from increased water intake and elimination through the kidneys or from the administration of mercurial diuretics. This has been found to be the case.

While the value of salt restriction in the presence of edema has been recognized for some years, Schemm was the first to call attention to the fact that if sodium, in the form of sodium chloride and sodium bicarbonate, is eliminated as far as possible from the diet, fluids not only need not be restricted but are beneficial in reducing edema if given in large amounts. While a "salt free" diet is unpleasant for the cardiac patient, the recognition by the physician of the needlessness of thirst in the treatment will be most welcome by the cardiac patient.

MORE NURSES NEEDED

THERE is still a great need for more nurses, both trained nurses and practical nurses. In publicizing the need and the advantages of training in the profession of nursing, a publicity campaign has been undertaken, and informative material has been sent to the Federated Women's Clubs throughout the state and to the members of the Hospital Auxiliary. The subject is one of timely importance and might well be taken up by the Woman's Auxiliary of the Minnesota State Medical Association.

Representatives of the state nursing, hospital and medical associations have been meeting to formulate a bill agreeable to all three interested professions, providing for legislative action for the licensing of practical nurses by the present legislature. It is to be hoped that agreement as to details will be reached, so that provision will be made for this licensing of practical nurses, a procedure which should stimulate recruiting of young women for the short course in training.

At the special meeting of the House of Delegates of the Minnesota State Medical Association on December 22, 1946, in Saint Paul, approval was given for the establishment of ten more schools of nursing with a three-year course leading to the title of registered nurse, and for twenty additional schools providing one-year courses for the training of practical nurses.

It seems that action will be taken by the present legislature providing for "licensed practical nurses." In anticipation of this outcome and in view of the great need of registered nurses and practical nurses, physicians can render a service by referring young women to the headquarters of the Minnesota Nurses' Association, 2642 University Avenue, Saint Paul 4; to the Franklin Hospital School for Practical Nursing, 501 West Franklin Avenue, Minneapolis 5; or to the Vocational Hospital, 5511 Lyndale Avenue South, Minneapolis 9, for detailed information as to requirements and opportunities for training in nursing.

CONSUMERS COOPERATIVE MEDICAL CARE

THERE is every evidence that Consumers Cooperatives are going to submit legislation to the present legislature to enable them to provide medical service for their members. They propose to furnish this service through the employment of physicians to care for co-operative members and their families. Such services are to be consumer controlled, in contrast to the various plans being promulgated by the various medical associations, and medical care is to be sold like other commodities such as food and merchandise.

One fundamental difference between the Consumers Cooperative plan and types of sickness insurance, a vital difference in the minds of the public as well as the medical profession, is that in co-operative supplied medical care there is no

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free choice of physician. The co-operative member receives his medical care from the employed physician or surgeon whether he be good, bad or indifferent. If there is one prerogative of which the American citizen is jealous, it is that when he is ill he can obtain what in his mind is the best available medical advice. Physicians, too, have insisted on the importance of maintaining the free choice of physician whenever possible, in order not to abrogate the stimulating effect of free competition on the quality of medical care.

Assuming that co-operatives may be able to employ first-class physicians, it seems quite probable that such physicians, being employees, will of necessity be dictated to in the matter of what services they may give their patients in the way of hospital care, medicines and the like. The holders of the purse strings must of necessity be largely interested in costs, and freedom of medical care is sure to be hampered.

MOBILE SPEECH CLINIC UNDERTAKES SURVEY

A concerted effort is under way to ferret out the speech and hearing handicaps among Minnesota's school-age children—handicaps which may hold them back in their classwork or contribute to making them social behavior problems.

A complete survey of the speech and hearing needs of 400,000 school children is the goal of the Mobile Speech Clinic of the University of Minnesota, staffed by the University and financed by the Minnesota Association for Crippled Children and Disabled Adults, Inc., from funds derived through sale of Easter Seals.

Directed by Miss Laila L. Larsen of the University, manned by Miss Larsen and two experienced clinicians and equipped with two pure tone audiometers and a Sound Scriber, the station-wagon-clinic will tour the state for three to five years on a project which both university and Minnesota Association officials hope will do much to waken the general public to the needs of the mentally competent but physically handicapped.

They see the whole problem as a continuous one, not one which can be solved by a traveling clinic in three or four or five years.

They foresee the time when, partly as a result of this initial project, public opinion will support long-range plans to give every child, no matter how remote his home or school, the opportunity to receive expert examination and early treatment of his handicap.

They hope to see the time when more and more special teachers and clinicians will be trained to staff permanent clinics set up to serve given areas of the state.

For purposes of research, the clinic, under the general administration of Dr. Bryng Bryngelson of the University, will gather data regarding such important

questions as the effects of foreign language background on speech.

It will attempt to correlate the speech and hearing difficulties of children with behavior problems and with failures in school, especially in spelling and reading.

Still another aim is to compare the effectiveness of testing with pure tone audiometers with that of screening with group test audiometers.

Although the Minnesota survey is not the first of its kind in the United States—others are in progress in Indiana, Iowa, Illinois, Oregon, Pennsylvania, Michigan and California—it is the first ever to use the pure tone machine which tests in all ranges of sound rather than in the speech range only. Every child is examined individually.

Since the staff of three—Miss Larsen, Gertrude Russell, hearing clinician, and Virginia Worthington, speech clinician—set out in their station wagon last September, they have covered two counties, surveyed sixty-seven schools, given 20,398 survey tests.

Through January 20, they had examined 10,866 school children in Washington and Stearns Counties, and had found that one of every five or six had some speech defect, while one of every fourteen or fifteen had a hearing handicap in need of special attention.

Of 9,208 children tested for speech, 614 had marked and 1,034 had slight defects. Of 11,190 tested for hearing, 519 had marked and 261 had slight disabilities.

Every disability, however minor, discovered in the screening test is followed up with a private conference with the child and his parents or teacher. While the first test requires about two minutes, an interview may last from fifteen minutes to an hour while the clinician investigates the background of the handicap.

Individual reports are forwarded to parents and teachers, summary reports and recommendations to the State Board of Education and the clinic's sponsor, the Minnesota Association for Crippled Children.

The clinic concentrates on diagnosis, not prescription, and parents are informed that the individual reports should be passed on to the family doctor to whom the child is taken for treatment.

However, when the clinicians' tests indicate that a child may respond to certain treatment, a recommendation to that effect is enclosed with the routine report.

Results in other states reveal that 20 to 40 per cent of handicaps uncovered in surveys actually do receive follow-up medical care.

Greater co-operation between parents and doctors can raise this percentage, Miss Larsen believes, but frequently the doctor must go out of his way to make up for parents' lack of initiative in bringing their children for treatment.

Often, she believes, the doctor takes it for granted that parents of course will return to him if an infected ear for which he has prescribed does not improve; or if a child, brought for consultation because he has not learned to talk at a normal age, does not overcome his retardedness in a reasonable length of time.

And too often, she continues, parents assume that because the doctor did not specifically request to see the

(Continued on Page 222)

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

AMA HOUSE OF DELEGATES AGENDA INDICATE ASSOCIATION'S GROWTH

Several topics were under discussion at the midwinter session of the House of Delegates of the American Medical Association, held in Chicago, December 9 to 11—topics which give evidence of the amazing rapidity with which the association has grown and the multiplicity of its functions.

On the agenda were such important subjects as improving health conditions in the coal mining areas, the possible significance of the new United Mine Workers' Health Fund, and ways and means whereby the medical profession can help the nation successfully realize the maximum benefits from the broad features of the Hill-Burton Hospital Construction Program.

Other matters taken up were the establishment of representation for the Veterans Administration in the fellowship of the association and in the House of Delegates; continued progress in the development of prepayment medical care plans; membership for general practitioners on hospital staffs; certain revisions in the constitution and by-laws; and plans for the observance of the association's one hundredth birthday at the 1947 annual meeting in Atlantic City.

Delegates Meet in "Free Atmosphere"

In a brief address before the assembly, the president, Dr. Harrison H. Shoulders, declared that this meeting "was being held in a different atmosphere from that which existed in July and from that which has been in existence for quite some time." He told the delegates that today's atmosphere "approaches freedom—the freedom to go forward in the accomplishment of the great mission of medicine."

Dr. Shoulders said that the AMA is a strong organization—an organization with a past of

which it can be justly proud and a future of which it can be hopeful.

Dr. Olin West, president-elect, added a firm second to Dr. Shoulders' remarks and voiced his confidence in the continued progress of the association in its efforts to promote the art and science of medicine. He called on physicians to do their utmost toward what he termed "the development of new financial techniques which will make medical care more available—the financing of it at least—to people of moderate means."

Conditions in Mining Areas Discussed

Much interest and attention at the conference centered on medical care and sanitary conditions among mine workers and their families. Present to report was Rear Admiral J. T. Boone of the U. S. Navy Medical Corps, who, as medical advisor to the Federal Coal Mines Administrator, organized and has been directing a survey of medical, hospital and general health facilities and sanitary conditions in the areas where bituminous coal is mined.

As a preface to his report of the situation in mining communities, Admiral Boone noted that the war years have been accompanied by "changes and dangers of a legislative nature" and that the medical profession has been confronted with a welter of new laws, bills and regulations bearing directly on public health and medical and hospital care. He reasoned that such proposals as have received so much public support stem from *real* as well as imagined needs of the people. They are symptoms, he said, of dissatisfaction with the medical profession as it practices its art today; and he declared that "physicians themselves should be the first to recognize these symptoms, diagnose the cause and prescribe the remedies, which will not merely allay the complaint, but produce the cure."

Mine Workers' Plight Is Vital Problem

While Admiral Boone recognized the fact that substandard health and sanitary conditions among coal miners is only *one* of the problems facing the medical profession, he said that it was nonetheless of vital importance.

Admiral Boone went on to describe the survey of mining communities which, under his direction, is now rapidly drawing to a close. The survey, initiated some six months ago by the Federal government and the miners' union when the government was operating the mines, Admiral Boone said, called for a review of conditions which would serve as a basis for providing miners some day with medical, housing and sanitary facilities conforming to recognized American standards.

Since the survey report was not yet complete, Admiral Boone did not feel he could reveal any specific and official results or conclusions to the delegates. However, he did present some personal observations, and he called to the attention of the House of Delegates, as a representative group of American doctors, what he said "would seem to be of major concern to organized medicine."

"The apparent weakness in public health programs in the nation's coal mining regions are deeply disturbing," Admiral Boone pointed out. He had observed, as a general rule, such inadequacies as poor water supply controls, improper sewage and garbage disposal, lack of "reasonable safeguards" against contamination from human and animal wastes, lack of protection in food and milk handling, and poor insect and rodent control. The number of mining communities with adequate facilities, he added, were too few in number to stand out as exceptions to this rule.

Lack of Public Health Work

It had been very disappointing, Admiral Boone said, to note what he called "a schism between curative medicine and preventive medicine." To explain this point, he said that, in the communities he visited, he inquired into the public health work done by "company physicians," and he found that very little was done beyond the usual school health programs of immunization. He found physicians so busy with their practice of curative medicine that they were reluctant to concern themselves with assuming leadership in public health, especially when there was so little to work with in the way of understanding and

willingness to understand on the part of the miners themselves.

Admiral Boone said he believes that not only does this condition exist in coal mining communities but it exists "far too generally." "I believe," he said, "that organized medicine can perform a noble task in closing the gap between curative medicine and preventive medicine." And he added, "Public health is not exclusively the concern of government."

"What we have seen," said Admiral Boone, referring to the subhealth standards uncovered by his investigations, "should rightly be the concern of every doctor, from the specialist in Chicago and New York to the general practitioner in the Appalachians. The health problem in the coal fields cannot be dismissed as a matter affecting less than 2 per cent of the population of the country or merely a few hundred physicians.

"As you well know, since diseases can become epidemics . . . since illness and disease in one segment of the population can and does affect the health and welfare of the entire nation, I am sure that you agree with me when I say that if we can help raise the health standards of coal-mining communities, we can contribute to the national well-being."

Background of United Mine Workers' Health Fund

Admiral Boone then turned to a discussion of the background and probable implications of the recent establishment by agreement between Secretary of the Interior J. A. Krug and the United Mine Workers' head, John L. Lewis, of the UMW Health Fund, which has been "highly disturbing" to physicians who practice in the coal-mining communities and to other physicians as well.

This fund, which is to be administered by trustees appointed by the president of the UMW, is to be accumulated from wage deductions of mine workers and is to be used for medical, hospital and related purposes "at the discretion of the trustees of the fund."

Collections for the fund, according to Admiral Boone, have not yet started, but what changes in the present system of medical practice will follow its establishment, no one, except possibly a few persons inside the UMW, can foretell.

Said Admiral Boone: "The mine physicians,

I understand, are not so much concerned about their economic security as they are about the maintenance of their professional status. That is the concern of all medical men, because the establishment of this particular medical fund may be the precedent for similar funds in other industries."

What changes this new departure, which may inject third parties between physicians and patients, will tend to bring about in medical practice, no one knows, said Admiral Boone. It is evident, however, he added, that the AMA has been handed a problem which cannot and is not overlooking.

"The views which organized medicine takes in handling such problems will help to fashion the pattern that is eventually evolved," Admiral Boone concluded. "Organized medicine must dissipate any emotionalism that beclouds sound reasoning and must assume leadership in the formulation and establishment of reasonable and practical programs that will benefit the people."

Delegates Act on Admiral's Advice

After hearing the Boone report, the Council on Medical Service made definite recommendations with regard to action which the AMA should take. In its report to the House of Delegates, the Reference Committee on Medical Service approved of the action suggested by the council, that the council shall continue to follow closely the developments of the bituminous coal situation. The report said that "it is recognized in these proposals (the UMW Health Fund) a new type of economic philosophy, one with far-reaching implications and concerns, which well may influence and possibly change the whole basic pattern of medical practice.

"The manner in which these funds ultimately will be administered, and the instrumentalities through which medical care will be delivered, will require our careful study and guidance. Such plans as these doubtless will occupy a prominent place in any collective bargaining of the future. . . . We shall have to project ourselves into this developing situation and play a leading role in the evolution of these plans for medical care."

Need for "Planned Co-operation" in Hill-Burton Program Stressed

How the Council on Medical Service is trying to impress all state medical societies with the im-

portance of planned co-operation to the successful carrying out of the provisions of the Hill-Burton law, was reported to the delegates by that body. As a service to state societies it is preparing a set of principles as a guide to such co-operation, and a set of minimum standards for diagnostic clinic facilities.

In addition, the medical profession, through its state and county societies, is being encouraged by the council to participate actively in all plans or programs formulated under the bill. Each state medical society, the council recommends, should have good representation in the agency charged with the responsibility of carrying out the provisions of the law in its particular state.

The council's report to the delegates drew attention to the fact that it is up to the state medical societies to see that facilities are placed only where a specific need for them is shown, and that diagnostic clinic facilities are erected only with the sanction of the county medical society concerned.

Formation of Health Councils Recommended

Among the other recommendations of the Council on Medical Service was one regarding the establishment of a National Health Congress, proposed in January of last year. The report favored "formation of state or local health councils to meet local needs and enlist the co-operation of their interested bodies," and said that the council will continue to work on such a program by calling a meeting of local health councils and other interested groups to discuss the value and scope of such councils and to draw up a model outline for their formation.

The council reported that after much study it feels that the setting up of a National Health Congress as a permanent body would not be advisable. Such a body, it pointed out, "would be bound to duplicate the efforts, and to a certain extent usurp the prerogatives, of this House of Delegates and other AMA bodies."

"In the opinion of the Council," the recommendation read, "it would be far better for the Board of Trustees, the Council on Medical Service and other AMA Councils to call conferences, whenever deemed advisable, on subjects on which the advice and co-operation of their bodies is desirable. In this way, different groups could be called on in matters pertaining to their specific fields; and there would not be one set group to

consider every subject." Therefore, the council asked specifically to have its previous instruction for the establishment of a National Health Congress rescinded.

Delegates Act on Variety of Questions

Several important decisions were made by the House of Delegates, specifically:

1. An amendment to the by-laws was voted, making it possible for general officers and delegates in the association to be nominated to the presidency without first having to resign from the position held.

2. The delegates passed an amendment permitting admission to fellowship in the AMA, without payment of dues, to members of the permanent corps of the Veterans Administration, for so long a time as they should remain with the Administration.

3. A resolution turned over to the Board of Trustees for "serious consideration" was one intended to promote closer co-operation between the medical and dental professions by the appointment of a committee of five AMA members to work with a similar committee set up by the American Dental Association, "inasmuch as physicians and dentists have a common interest in the extension of health service." It was recommended that this move be carried through on the state level also.

4. Another resolution called for the establishment of general practice sections in approved hospitals, specifying that these appointments should be made by hospital authorities "on the merits and training of the physician," and that "membership on a hospital staff should not be dependent on certification by the various specialty boards or membership in special sections."

5. The establishment of a certifying board to determine the qualifications for general practice was the subject of a related resolution, asking that the Section on the General Practice of Medicine of the AMA give consideration to a plan for the establishment of such a board, and that the section make a preliminary report to the House of Delegates in June at Atlantic City.

6. As a result of deliberations at this session of the House, there is now at association headquarters a Division of Public Relations, under an executive assistant to the general manager, which will handle public relations activities for all councils, bureaus, publications and other agencies and operations of the association.

7. The delegates approved a resolution directing the Council on Medical Service and the Council on Industrial Health to "continue close co-operation with mine physicians in an effort to improve and maintain the high standards of medical practice."

Bureau of Medical Economics Reorganizes

It was announced by the Bureau of Economic Research (formerly the Bureau of Medical Economics) that under the leadership of its new director, Professor Frank G. Dickinson, it plans to reactivate and expand, with the emphasis on research.

A current job of this bureau is an extensive survey of medical services in each state. Questionnaires are being sent to county medical society secretaries, asking them to draw on a state highway map a line around the area served by physicians located in each county medical center.

The bureau is also assisting with the tabulating and analyzing of the completed questionnaires now pouring in from the thousands of returned medical officers. Reporting that the response in this survey has been remarkable, the bureau promises to study the some 20,000 questionnaires and will file a report with the Committee on National Emergency Medical Service, which is directing the survey, some time in April.

Elaborate Plans for Centennial Announced

Elaborate plans for the AMA centennial celebration in Atlantic City, June 9 to 13, which promises, according to the skeleton outline presented to the delegates, to be "the high point in the assemblages of physicians anywhere in the world," were announced. Plans include a banquet honoring leaders in industry and the various occupations associated with medicine, at which time distinguished speakers will comment on the influence of American medicine on the nation's progress.

A religious service on Sunday, June 8, presenting three great religious leaders who are to speak on the spiritual aspects of medicine and health, will be broadcast from Atlantic City. Plans are to invite ministers throughout the nation to join the observance by speaking on similar topics.

The outline promises that the annual meeting will present the largest technical and scientific exhibit ever developed by the AMA, and will include a public exhibit set up on the boardwalk,

depicting the progress of scientific medicine. General and special sessions are scheduled; distinguished foreign guests are being invited, and a motion picture program is planned which will include, among other special showings, a film on the evolution of the scientific medical motion picture.

Washington's "New Political Flavor" Reviewed

Delegates heard a review of the complexion of the new Congress in a report from the Bureau of Legal Medicine and Legislation, in which the names of new committee chairmen were listed and predictions were made as to what the "new political flavor" in Washington would mean in the way of medical legislation.

Plans were announced at the session for a Second Annual National Conference on Rural Health to be held February 7-8 in Chicago, in order to provide farmer and doctor with another opportunity to exchange views regarding the many questions which are of vital importance in developing better health service in rural areas.

The Council on Industrial Health reported that it is watching closely developments in the World Health Organization, noting in its report that "information is not yet available, particularly regarding the status of industrial hygiene in the proposed organization." It was observed that there will probably be a mixed committee of public health experts, representatives of the International Labour Office and the World Health Organization itself, to consider matters of social insurance and industrial hygiene. Meanwhile, the council reported, the United Nations organization is establishing itself in New York and is setting up a health program for its employees, who will probably number about 2,000.

Included in the industrial health report was an interesting bit relative to this "Atomic Age." The council is deeply interested in the organization of the Board of Consultants on Atomic Energy, being set up under the sponsorship of the Council on Physical Medicine. The report says that "since it is proposed to use nuclear energy in industry as a source of power, the question of occupational risk is of considerable importance." A symposium of atomic energy in industry and medicine, under the joint auspices of the Council on Physical Medicine and the Council on Industrial Health, was an event of the recently held Seventh Annual Congress on Industrial Health.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

230 Lowry Medical Arts Bldg., Saint Paul, Minnesota
Julian F. DuDois, M.D., Secretary

Minneapolis Woman Sentenced to Three-year Term for Criminal Abortion

Re. State of Minnesota vs. Clara Olga Anderson, Irene E. McFarland and Isadore Abramovich.

On December 28, 1946, the Hon. Levi M. Hall, Judge of the District Court of Hennepin County, sentenced Clara Olga Anderson, forty-eight years of age, 1142 Emerson Avenue North, Minneapolis, to a term of three years at hard labor in the Woman's Reformatory at Shakopee. The defendant, Anderson, had pleaded guilty on that date to an information charging her with the crime of abortion, and also with having had a previous conviction for a similar offense in 1943. A plea by the defendant's attorney for a suspension of sentence and an opportunity for the defendant to leave the State, was denied by Judge Hall. On the same date Irene E. McFarland, forty-six years of age, 1514 Sixth Street North, Minneapolis, and Isadore Abramovich, twenty-four years of age, 706 Elwood Avenue North, Minneapolis, entered pleas of guilty to an information charging them with the crime of abortion in the same case with the defendant, Anderson. Judge Hall sentenced the defendant, McFarland, to a term of one year in the Minneapolis Woman's Detention Home, suspended the sentence and placed the defendant on probation. The defendant, Abramovich, was sentenced to a one-year term in the Minneapolis Workhouse, the sentence being suspended and the defendant placed on probation.

The three defendants were arrested on December 12, 1946, by Minneapolis police officers, following the admission of a twenty-three-year-old young woman to Minneapolis General Hospital suffering from the after-effects of a criminal abortion. The investigation disclosed that the defendant, Anderson, attempted to abort the patient by means of a catheter, on December 10, 1946, at the home of the defendant, McFarland. The patient paid the defendant, Anderson, \$150 for the criminal abortion of which sum \$25.00 was given to the defendant, McFarland, for the use of her home while the abortion was being done. The defendant, Abramovich, employed as a "bouncer" at a Minneapolis bar, was arrested when it was disclosed that he was the contact man for the criminal abortion.

The defendant, Anderson, has a previous conviction for criminal abortion, having pleaded guilty in the District Court of Hennepin County, on March 25, 1943, to an indictment charging her with the crime of abortion. In that case Mrs. Anderson was sentenced to a term of not to exceed four years at Shakopee, but was placed on probation after serving one year in the Minneapolis Woman's Detention Home. None of the defendants has a license to practice any form of healing in the State of Minnesota.

GLOMUS TUMORS

(Continued from Page 160)

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Minneapolis Surgical Society

Stated Meeting Held November 7, 1946

The President, Thomas J. Kinsella, M.D., in the chair

POSTOPERATIVE ANURIA

Complicated by Duodenal Ulcer, Hemorrhage, Bilateral Pneumonia and Toxic Urticaria

L. A. STELTER, M.D.,
Minneapolis, Minnesota

The term oliguria, meaning deficient secretion of urine, and the word anuria, meaning scanty urine, may be used interchangeably, as they represent symptoms of some critical urinary disease. They represent the failure of the kidneys to excrete urine, and the longer the condition exists the more rapidly the state of uremia is approached.

The term uremia, introduced by Piory in 1848 to denote a state of intoxication due to resorption of urine, has now come to include all the toxic states which develop as a result of renal insufficiency. Uremia may be acute or chronic, the acute type arising from rapid suppression of urine; and the chronic type occurring from diseases which cause a slowly developing state of intoxication.

In 1821, Prevost and Dumas discovered that urea accumulated in the blood of a dog following removal of both kidneys. Bright, in 1836, knew that people suffering from nephritis had an increase in blood urea. According to Musser, severe intoxication may be manifest from 60 to 100 mg. per cent of urea; while in more chronic processes, where there is a gradual accumulation, mild symptoms may appear only after values higher than 100 mg. per cent. Values have been observed as high as 1,000 mg. per cent.

Creatinine values, normally 1 to 3 mg. per cent, may rise as high as 60 mg. per cent, but values above 5 mg. may have a serious prognosis, suggesting a fatal outcome. Recoveries have been recorded when creatinine has risen as high as 12 mg. per cent.

Rehberg and Holten calculated that 100 to 150 c.c. of fluid must filter through the glomeruli of the kidney per minute to accomplish the usual excretion of creatinine. Calculations were based on investigations of Vimtrup that the human kidney contains 2,000,000 glomeruli with a total surface of approximately 1.6 square meters. The effective pressure for filtration through the glomerular membrane is the difference between the glomeruli blood pressure and the force opposed by the osmotic pressure within the Bowman's capsule. If the number of glomeruli are reduced by disease, the filtration must necessarily be reduced. Similarly, fluctuations in the plasma protein have a direct effect upon the degree of filtration which is decreased if the protein content is increased.

Dr. Stelter appeared on the program by invitation.

Causes of Oliguria and Anuria

The causes of oliguria and anuria are numerous, and the most important may be listed as follows:

1. Kidney diseases in the terminal state; nephritis and nephrosis.
2. Toxic manifestations due to poisons, drugs, intravenous fluids or medications, and eclampsia.
3. Mechanical obstruction due to calculi, bilateral tumors including the ureters, surgical ligation of the ureters. Papin cited five cases of carcinoma of the rectum with anuria as the initial symptom. Nephroptosis has also been given as a mechanical cause.
4. Hysteria. Gordon reported a case of an hysterical woman with anuria which lasted two days and was cured by suggestion. Grenier saw an hysterical woman through five attacks of anuria lasting two, four, six, seven and fifteen days, respectively.
5. Surgical anuria resulting from shock, sympathetic trauma, and anuria from unknown cause following surgery.

Little has been written about this unfortunate disaster following a surgical procedure on the urinary tract or following a general surgical operation. Most authors stress the catastrophe as being due to varying blood pressure levels during an operative procedure or the result of blood transfusions (incompatible blood) in combating shock, where the blood pressure is definitely lowered and where a surgical procedure had been of long duration accompanied by fluctuating blood pressure.

Coller found that continuous inhalant anesthesia over long periods of time may affect the output of urine, but he was unable to find any evidence of either ether or cyclopropane causing any gross effect on glomeruli permeability.

Sturmia states that when incompatible blood is injected intravenously, rapid hemolysis occurs with the clinical symptoms of a chill, nausea, vomiting, lumbar pain, tightness and constriction of the chest, and elevated temperature following almost at once. There may be additional symptoms of abdominal pain, bladder pain and the urge to defecate. Transient hemoglobinuria with scant reddish brown urine appears, followed in a few hours by jaundice. The jaundice reaches its peak in twenty-four hours. The oliguria may improve and the patient may recover rapidly but more often it leads to uremia and death.

Sturmia lists as possible causes of oliguria (1) blockage of the renal tubules, (2) anaphylaxis, (3) ischemia of the kidneys from vasomotor constriction, and (4) nephrotoxic substances released by hemolysis. The first three he refutes but believes the fourth more feasible as there is a strong similarity pathologically between post-transfusion nephrosis and chemical nephropathies.

Bywaters showed in crushed muscle necrosis, causing shock, in the early blitz of London, that patients seemed to do well for several days, only to develop elevated blood pressure and die as a result of suppressed renal function. Two-thirds of the patients died at the end of the first week, the majority on the sixth day. About one-third of the cases recovered because urinary output was maintained.

Treatment

The treatment is chiefly preventive. Proper blood grouping and cross-matching are necessary before transfusions are given. It is well to establish alkaline diuresis by large doses of sodium bicarbonate by mouth until the urine is alkaline. The alkalinity should be maintained. If the patient is vomiting, a fresh solution of 1.4 per cent sodium bicarbonate may be given intravenously. Isotonic sodium lactate may be given intravenously. Fluid intake should be kept up to 2 to 3 liters a day, with sufficient saline to keep up the chloride level. If renal failure occurs, the treatment is identical; the addition of mercurial diuretics may be introduced, and decapsulation of the kidney considered.

Case Report

G. L., No. 1327311, aged thirty-six, white, an engineer by occupation, entered Fairview hospital at 2:00 P.M. on February 28, 1945, complaining of pain in the right lower abdomen and flank. He had become acutely ill at 2:00 A.M. and ascribed his illness to a few highballs and a heavy meal at a banquet the night before. During the night the pain became more intense, radiating down the right side and towards the back. There was nausea but no vomiting. He had no urinary disturbance, no nocturia, and no testicular pain, but felt some discomfort in the scrotum.

His past health had been good except for some indigestion; he had intolerance to fried and fatty foods and rare meats. Cabbage and oranges always gave him distress. For the past year or two, he had had some pain in the right side. Six months prior to the present illness he had a similar attack, at which time he went to another clinic where gastrointestinal, gall-bladder and colon studies revealed nothing abnormal. He was advised to have his appendix removed on the basis of a probable retrocecal location. This he refused to have done and returned to his home and work.

Physical examination revealed a robust, well-developed male, acutely ill. Except for the abdomen, physical examination revealed nothing abnormal. His pulse was 76, temperature 99.4° F.; blood pressure was 124 systolic and 75 diastolic, in millimeters of mercury. The contour of the abdomen was normal. The muscles were spastic. Palpation revealed no tumor nor masses, but the muscles of the right side were held rigid and he complained of tenderness in the right lower quadrant. There was also tenderness in the right lumbar region on Murphy percussion. There was no rebound tenderness and the testicles were not sensitive. The extremities and reflexes were normal. Rectal examination revealed nothing of note. A tentative diagnosis of acute appendicitis or some right-sided nephritic disease, ureteral stone or perinephritis, was made.

Laboratory tests showed a hemoglobin of 91 per cent. There were 11,900 white blood cells in each cubic millimeter of blood. Differential examination showed segmented neutrophils 82 per cent, lymphocytes 16 per cent, monocytes 2 per cent. Urinalysis was normal except for two red cells and three pus cells in the high dry field. Specific gravity of the urine was 1.022. A scout film of the abdomen revealed nothing abnormal.

In spite of the above findings, I decided against surgical intervention, and on March 1, 1945, rechecked the laboratory procedures and found the urine normal except for four pus cells in a high dry field. The leukocyte and differential counts were normal. On March 2, 1945, an intravenous pyelogram revealed a marked hydronephrosis of the right kidney. The condition was discussed with the patient and he was advised to have a cystoscopic examination and a retrograde pyelogram made. He elected to have this done at a future date and returned to his home.

On March 7, 1945, he returned to Fairview hospital, and repeat laboratory examinations were within normal limits. On March 8, a cystoscopic examination was performed by Dr. R. T. Soderlind, who noted that "prostate, bladder and meatus were normal. Indocarmine appeared in normal time from the left meatus. No dye appeared from the right meatus although urine was spurting. A catheter was passed to the right pelvis and 50 c.c. of urine aspirated. A No. 6 catheter was left indwelling. A pyelogram revealed marked hydronephrosis of the right kidney."

Operation was advised and the patient was prepared for operation. His blood was grouped, matched and cross-matched for blood transfusions; fluids were forced, and sulfadiazine and sodium bicarbonate given. On March 11, an indwelling catheter was passed into the right ureter to reduce the size of the hydronephrosis. Urine from the right ureter showed three pus cells in a high dry field. No tubercle bacilli were found. The blood urea was 13 mg. per cent, creatinine 1.2 mg. per cent.

On March 14, 1945, the right kidney was removed under cyclopropane anesthesia. Operating time was one hour thirty-four minutes. Extensive adhesions and induration around the entire capsule made the procedure more difficult. The patient received 5 per cent glucose in normal saline intravenously during the operation. His pulse varied between 90 and 130 per minute, and his blood pressure from 100 systolic, 70 diastolic, to 154 systolic and 90 diastolic, in millimeters of mercury. He returned to his room in good condition.

Five hundred cubic centimeters of normal saline and 500 c.c. of citrated blood were given intravenously in the afternoon following the operation. He made satisfactory progress, and the blood pressure and pulse were normal. At 9:30 that night he was catheterized and 400 c.c. of urine obtained. At midnight he tolerated 1,000 c.c. of 5 per cent glucose in distilled water, and had a fair night. At 6:00 A.M., March 15, he complained of severe chest pain, generalized distress, dyspnea, and a faint feeling. His pulse became thready, weak and rapid; the rate rose to 150 per minute. The blood pressure was 80 systolic and the diastolic could not be heard. He was given neosynephrin, 250 c.c. of plasma intravenously, 500 c.c. of normal saline, and 500 c.c. of citrated blood, after which he rallied from shock and his blood pressure rose to 110 systolic and 70 diastolic, and his pulse stabilized at about 110. At 9:30 A.M., March 15, he was catheterized and 5 c.c. of urine obtained. In the afternoon the patient became confused and irrational, but this was only transitory. An indwelling catheter was inserted in the bladder and 5 c.c. of urine obtained. Penicillin, 20,000 units, was given every three hours. One thousand cubic centimeters of 5 per cent glucose in normal saline and 1,000 cubic centimeters of 5 per cent glucose in distilled water were given intravenously morning and afternoon. Copious fluids were given by mouth, with large doses of alkalies, in an effort to establish diuresis. On March 16, nasal suction was instituted because of abdominal distention. On March 17, the condition of the patient was unchanged. The wound was inspected and the drains removed. In spite of the large fluid intake and the elevated metabolites, the condition of the patient remained fairly good. He showed no gross evidence of uremia. His skin, however, became deeply bronzed and

jaundiced, reaching its height on the fourth day. On March 18, Dr. Soderlind passed a catheter into the left ureter and also left a Foley catheter in the bladder. Supportive treatment and forced fluid intake were continued. When the nasal suction could be clamped off, alkalies were given in large amounts. In the evening the patient began to doze a great deal; in waking intervals he became very restless and irritable. His blood pressure rose gradually up to 180 systolic and 78 diastolic. His pulse slowed.

On March 19, Dr. Theodore Sweetser saw the patient in consultation and recommended increase in fluid intake, hot packs and diathermy over the left kidney. Decapsulation was suggested if the urine did not increase in amount. On March 20, at about 8:30 A.M., he became very restless and irritable. He was put in restraints, and he thrashed about. At 8:45 he had a convulsion of several minutes' duration, which, according to the nurse, occurred after he lapsed into deep coma. Dr. Sweetser advised decapsulation of the left kidney under local and gas anesthesia.

The capsule of the left kidney was stripped completely, anteriorly and posteriorly, the poles explored and found normal, and the wound closed rapidly. He stood this operation surprisingly well. In his room, saline and another transfusion were started. At 4:30 P.M., the ureteral catheter began to drip and by 7:45, about 50 c.c. of urine had been collected. At 11:45 P.M., 100 c.c. more had been excreted. However, the patient's condition was critical and he was placed under an oxygen tent, which he constantly attempted to tear off. His twitching and muscular jerkings were controlled by sodium luminal.

His general condition from now on showed a gradual improvement, though he remained unconscious. The right wound was torn open by positioning on the operating table. By March 23, he was removed from the oxygen tent. On March 25, he developed a very harsh cough, elevated temperature and expectoration. X-rays of his chest revealed nothing noteworthy. His cough subsided and he again seemed to improve.

On March 27, following a hard coughing spell, during which time he raised a great deal of thick purulent mucus, he had a defecation of black stool, found to be blood. On account of repeated positive findings of blood in the stool, a diagnosis was made of bleeding duodenal ulcer and he was treated by the Cook County bleeding ulcer regime. He was kept on the diet, given creamalin, vitamin K, thiamin chloride, vitamin C, liver extract, and repeated blood transfusions, to which he responded well.

He continued to improve, and on April 24, the wound of the right side was completely debrided and closed with interrupted silk sutures. It now healed readily, and on May 1 he was allowed to sit up. At 11:30 A.M. on May 2 the patient developed dyspnea and pain in his left chest. His symptoms simulated those of a pulmonary embolism and for a while it was feared he would expire. X-rays on May 6, following a similar attack in the right chest, revealed pneumonia on both sides. He again responded to penicillin and an oxygen tent, and roentgenograms on May 9 showed the pneumonia to be subsiding on the left side. On May 13, when he seemed well on his way to recovery, giant urticaria developed over his entire body. Penicillin was discontinued and the urticaria responded to epinephrine. On May 15, the patient was allowed out of bed while all attendants held their breath for fear of another catastrophe. On May 19, he left the hospital in ambulatory condition.

The surgical specimen showed a large kidney with multiple abscesses, massive suppurative and liquefaction. The infection was nontubercular. The diagnosis was multiple carbuncles of the kidney.

Stomach x-ray studies on July 7, 1945, by Dr. J. Kelby, verified the diagnosis of duodenal ulcer.

The patient's health to date has been good. A recent

examination revealed normal blood and urinary findings, and his last weight was 197 pounds.

Comment

It is my opinion that this patient had a postoperative anuria resulting from a transfusion reaction, the reaction occurring about fourteen hours after the transfusion. This delay I cannot explain. Ordinary routine care, based on the treatment of uremia, failed to alter the picture. Uremic convulsions ensued and, as a last resort, decapsulation was done. It is possible that splitting the capsule and manipulating the kidney decompressed the glomeruli sufficiently to permit the excretion of urine. A biopsy of the kidney would have given valuable information. The numerous complications of wound disruption, bilateral pneumonia, bleeding duodenal ulcer, and urticaria were coincidental to the illness, and only added to the patient's discomfort and the attendants' grief.

Discussion

DR. CLARENCE DENNIS: I have nothing to contribute, but I would like to ask a question for my own information. There is evidence to believe that alkalinizing urine does not have any benefit in preventing renal damage. I am curious.

DR. L. A. STELTER: Alkalinization has been suggested in the literature to help prevent reactions in blood transfusions.

DR. EDMUND FLINK: There are a few comments which I would like to make regarding the problem of reaction of the urine in relation to renal damage from hemoglobinuria. I carried out some experiments, causing hemoglobin solution in dogs which had a strongly acid urine and in dogs which had alkaline urine, and obtained renal biopsy thereafter. Renal damage with uremia resulted whether the urine was acid or alkaline. The number of dogs was not great. At the time when the urine was strongly alkaline as well as when the urine was acid, hemoglobin precipitated in the tubules, toxic changes occurred, and one couldn't distinguish the kidneys of the dogs that had acid and alkaline urine. The dogs which developed renal damage had the highest plasma hemoglobin levels, regardless of urine reaction. No renal damage developed when relatively lower hemoglobin levels were found.

One bit of evidence is presented in black water fever which results in anuria in quite a number of cases. The mortality rate in a large series of patients whose urine was alkalinized as soon as hemoglobin appeared in the urine is the same as in an even longer series of patients to whom alkalies were not given.

There has been recent work which would support the idea that alkalinization has benefit. Yulie has clamped both renal arteries in rabbits for fifteen to twenty minutes and injected small amounts of hemoglobin solution. The animals that had alkaline urine suffered no kidney damage at all, and those that had acid urine had severe kidney damage, similar to transfusion reaction kidneys. His idea was based on the fact that transfusion reaction is often accompanied by shock-like state, renal anoxia, et cetera, and he was trying to simulate that condition. Thus, there may be some evidence that alkalinization is of use. The original basis of alkalinization was on rather flimsy ground. The work of Baker and Dodds, who used very few rabbits for their experiments, gives very little pertinent data and their conclusions are not convincing. DeGowin, who carried out a large number of experiments on dogs, still left the question open. I don't know what the answer is. If one is going to accomplish anything, however, alkalinization before transfusion, or at least immediately

after demonstrating a hemolytic reaction, should be carried out promptly. One must be certain the urine becomes alkaline too. A great deal of harm can result from the indiscriminate administration of a large volume of alkali to a patient with anuria or oliguria. I am quite certain that attempts to alkalinize the urine once anuria has developed will not be of the slightest value and may be harmful.

There are several other ideas. Those patients received sulfadiazine at the time of anuria. Sulfadiazine possibly contributed to kidney damage. Another thing, whenever one has a transfusion reaction, it is well to find out immediately whether or not there is a hemolytic reaction. One easy way is to obtain a specimen of plasma or serum immediately. If the serum or plasma is obtained carefully, there will be no hemoglobin visible normally, but if there has been a hemolytic reaction, there will always be hemoglobin present in sufficient quantity to color the plasma red. Normal appearing plasma or serum will ease one's mind that a febrile reaction is not a hemolytic reaction. On the other hand, absolutely essential information will be obtained when a true hemolytic reaction has occurred.

THE USE OF CHEMICAL AGENTS IN THE TREATMENT OF HYPERTHYROIDISM

EDMUND B. FLINK, M.D.
Minneapolis, Minnesota

In May of 1943, E. B. Astwood of Boston¹ published a report on the reduction of basal metabolic rate and the abolition of signs and symptoms of hyperthyroidism in three patients using thiourea and thiouracil by mouth.

In 1941, MacKenzie, MacKenzie and McCollum¹² reported a remarkable enlargement of the thyroid in animals which had been fed sulfaguanidine. Two simultaneously published studies by MacKenzie and MacKenzie¹³ and Astwood, Sullivan, Bissell and Tyslowitz⁴ made clear the unique nature of the new goitrogenic agents of which sulfaguanidine is the prototype and thiouracil the best known example.

The goiters produced by these agents, unlike those produced by the older goitrogens,^{10,15,17} viz. soy beans, thiocyanate, cabbage and seeds of the Brassica family, generally cannot be prevented or abolished by iodine administration. The currently accepted view^{8,11,14} of the action of thiouracil, as characteristic of the new thyroid drugs, is that it inhibits the uptake of iodine and the formation of thyroid hormone by the thyroid gland,^{3,9,14,16} colloid typically being reduced or depleted,^{4,11} and basal metabolic rate falling. In the presence of normal thyroid function, the pituitary is believed to overact, producing hyperemia and epithelial hyperplasia of the thyroid; this explanation of the thyroid hyperplasia is based upon (1) the known action of the thyrotropic hormone of the pituitary, (2) observable histologic changes in the pituitary following sulfaguanidine administration, (3) the ability of administered thyroxine to prevent or abolish thiouracil-induced hyperplasia of the thyroid, (4) the absence of thyroid hyperplasia in hypophysectomized animals given the new goitrogens.^{4,11}

Thiouracil (2-thiouracil)² was found to be the most potent of the earlier substances tested. More recently, ethyl and N-propylthiouracil have been found to be more active than thiouracil. Thiourea, thiobarbital, and various substituted ureas are active agents also.

More than 5,000 patients have been treated with thiouracil since 1943. We have had experience treating approximately sixty-five patients with thiouracil at the University Hospital. Most of the patients were treated as a preoperative measure. Six patients, however, were maintained for long periods on thiouracil. Two patients have been lost from sight since discontinuing the drug. One adolescent girl has been able to stop the medication without recurrence of symptoms. Two adults have repeatedly demonstrated that there is prompt return of symptoms after discontinuing thiouracil, even eighteen or more months from the time of starting therapy.

The speed of response as measured by the basal metabolic rate, by weight gain, et cetera, has compared favorably to that obtained by other investigators. The basal metabolic rate dropped to +20 per cent in from four to eight weeks. Patients who had iodine before starting thiouracil responded more slowly than those who had not had iodine previously. Most of the patients had moderately severe to severe hyperthyroidism.

Failure to control symptoms adequately has occurred in three cases even after continued administration for as long as three months. Perhaps longer trial would have been successful, but thyroidectomy was carried out in each instance, successfully in two but resulting in death shortly after operation in one. All had had iodine for varying periods before thiouracil therapy, with very poor results and obviously were resistant to further action of iodine. They had large nodular goiters, had basal metabolic rates over +50 per cent, and had at least some cardiac disability. Two were diabetics.

When the patients were in an approximately normal state of metabolism, thyroidectomy was usually carried out without event. In several instances thyroidectomy presented some technical difficulties. When the basal metabolic rate was normal before operation, the postoperative convalescence was as uneventful as after operations on a nontoxic goiter. The routine use of iodine for several weeks before contemplated operation has decreased the technical difficulties appreciably.

The largest single group of patients treated for a prolonged time is that of Williams.²⁰ One hundred patients were followed for a period of many months. Forty-nine patients have had remissions lasting from three to twenty-one months, and fifty-one have had relapses in from two weeks to five months (most of them in one month). X-ray therapy, coincident thyroid administration, type of hyperthyroidism and severity of the hyperthyroidism had no significant effect on the percentage of relapses. Males tended to have many more relapses than females (fifteen out of nineteen males). Patients with large glands tended to relapse more frequently than others.

The most important consideration of all is the frequency and severity of toxic reactions. The largest

collected series analyzed the records of 5,745 treated patients.¹⁸ Thirteen per cent had some toxic reactions. Granulocytopenia occurred in 2.5 per cent of cases, and 80 per cent of these occurred by the twelfth week. A mortality rate of 0.4 per cent has been reported and all deaths have been attributed to agranulocytosis. There is no evidence that folic acid, pyridoxine or any vitamin influences the course or prevents the complication. By controlling infection, penicillin appears to be the best therapeutic agent for agranulocytosis. Other important toxic reactions include fever, rash, arthralgia, delirium, purpura, salivary gland enlargement, neuritis, headache, and jaundice. Reports of smaller series of cases have indicated an incidence of 10 to 16 per cent toxicity.¹³

The recommended dose is from 0.4 to 0.6 gm. per day in divided doses until the basal metabolic rate approaches normal, after which the dose can be reduced to 0.1 to 0.4 gm per day. It is well to administer iodine in full doses for ten to fourteen days before contemplated surgery. If iodine has been administered within a month, it is not advisable to stop iodine during the course of treatment.

Because of serious toxic reactions, thiouracil probably should be used only in patients who have one of the following conditions: (1) thyrotoxic heart disease with or without auricular fibrillation, (2) organic heart disease complicated by coincident hyperthyroidism, (3) severe hyperthyroidism treated with iodine for a variable period without adequate response, and (4) patients refusing surgery or other treatment. Careful follow-up must be possible. Leukocyte counts three times a week, frequent check for fever, skin rashes, other symptoms, and observations of the bleeding mechanism must be made. After several months vigilance can be relaxed somewhat but leukocyte counts should be determined every week then.

Danowski, Man and Winkler⁷ have recommended the use of small doses of thiourea along with iodine as a form of maintenance therapy in hyperthyroidism. They have treated fifty-four cases successfully. Two patients developed fever shortly after starting thiourea. The dose used ranged from 0.07 gm. to 0.28 gm. of thiourea and 15 drops of strong solution of iodine a day. The response was more prompt in almost every case than in the usual experience with thiourea or thiouracil alone.

N-propyl thiouracil is a recent addition to the group of goitrogenic drugs. In animals it is effective in 1/6 to 1/10 of the dose of thiouracil. Astwood⁹ reported the treatment of thirty-five patients without any toxic effects. Now over 600 cases have been treated but there are instances of drug fever, leukopenia, skin rashes and other similar complications. Doctors Bieter and Troxil of the Department of Pharmacology have been supervising its use here at the University of Minnesota. Fifteen cases have been treated. Two patients developed fever and leukopenia (and one a severe rash also). Propyl thiouracil may not have been the cause in either case. One patient developed a severe rash and fever from phenobarbital. Satisfactory response has occurred in eleven cases, no response in one case and toxic reactions in two cases. The period of observation was too

short in one. The responses have been comparable to the ones observed when thiouracil is administered. Propyl thiouracil has been administered in doses of 75 mg. per day, but more recently up to 200 mg. have been recommended. It appears to have definite advantages over thiouracil but still is not without dangerous toxic complications.

The use of radiation therapy in hyperthyroidism is well known. It is effective in a fairly high percentage of cases. The idea of the use of "internal radiation," using various radioactive isotopes of iodine, has been current for about ten years, but the unavailability of radioactive iodine and various other factors have limited its application.

Hertz and Roberts⁹ reported the results of treatment of twenty-nine patients with radioactive iodine, and Chapman and Evans⁶ reported the treatment of twenty-two additional patients. Both groups used I¹³⁰ (with a small amount of I¹³¹). I¹³⁰ has a half life of twelve hours, and I¹³¹ has a half life of eight days. Both substances emit beta rays in the process of decomposition. The calculation of dose of isotope used depended on the following data: (1) fractional uptake of radioactive iodine by the thyroid, (2) the known energy of the radiations from I¹³⁰ and I¹³¹ (3) the clinical estimation of the weight of the thyroid of the patient, and (4) the known pattern of uptake and retention of radioactive iodine by hyperplastic thyroid gland of hyperthyroidism.

Hertz and Roberts⁹ used from 1.5 to 28 m.c. of I¹³⁰ giving an estimated 500 to 2,500 roentgens (plus or minus 50 per cent) to the thyroid. Of twenty-eight patients whom they felt had received adequate dosage (questioned by Evans and Chapman⁶, five patients underwent subtotal thyroidectomy partly as a means to evaluate therapy. Twenty patients are not thyrotoxic, and three patients must be considered failures, three or more years after therapy. Every patient who had a subtotal thyroidectomy developed myxedema or hypometabolism, indicating continued progress of involution after the thyroidectomy.

Chapman and Evans⁶ used much larger doses—from 0.5 to 1.2 m.c. per gm. of estimated thyroid weight. In a series of twenty-two patients so treated, twenty are either nontoxic or myxedematous, and only two failed to show a return to normal metabolic state. The decline in basal metabolic rate to normal occurred over an average period of sixty days. Five patients had multiple doses. It is apparent that this last series of cases from the Massachusetts General Hospital responded more promptly and completely than those of Hertz and Roberts.

In order to carry out such therapy adequately, it is imperative that a competent physicist be able to follow the treatment, measuring carefully the amount excreted, the calculation of dose, et cetera.

One patient has been treated with I¹³¹ (half-life of eight days) at the University Hospital. Doctor Stenstrom and the staff of his laboratory have carried out the necessary calculations of dosage, excretion, and uptake by the gland, in terms of roentgen equivalents. The patient is a twenty-nine-year-old woman with very severe hyperthyroidism of about six months' duration.

Her basal metabolic rate at time of hospital admission, after taking iodine for three weeks, was +65 per cent. Her condition has been precarious. Propyl thiouracil was started, but a generalized skin eruption, leukopenia and fever developed shortly afterward. This actually proved to be due to phenobarbital rather than propyl thiouracil. Too short a time has elapsed since giving the radio-iodine to determine what the response will be, but she has improved quite definitely now.

Conclusions

The mode of action, effectiveness, dangers and indications of the thiouracil group of drugs have been reviewed. These agents have added a great deal to our understanding of the physiology of the thyroid gland and have proved to be of very real value in the control of hyperthyroidism. The thiouracil compounds do not supplant thyroidectomy, but merely supplement it at the present time.

Radioactive iodine gives promise of being an important tool in the medical therapy of hyperthyroidism. Since its use depends on fairly elaborate equipment and a thorough knowledge of physics, for the present only a few clinics and hospitals are able to use radioactive materials.

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EXTERIORIZATION PROCEDURES FOR COLON INJURIES

U. SCHUYLER ANDERSON, M.D.

Minneapolis, Minnesota

In addition to well-established principles which are followed in the management of intra-abdominal trauma, exteriorization procedures for large bowel injuries have been found extremely valuable. For the purpose of discussion, exteriorization procedures may be considered to include not only the actual exteriorization of the damaged segment of bowel but also colostomies formed proximal to the site of injury in a part of bowel which cannot be brought outside the abdominal cavity. However, it is important to note the distinction between exteriorization of a wounded segment of bowel and the construction of a colostomy for the purpose of defunctionalizing the distal segment. At times both purposes may be accomplished by one and the same procedure, but a clear understanding of the purpose of the operation is necessary to the selection of the techniques involved.

While stationed at army general hospitals, one in this country, and one overseas, the author became impressed with the usefulness of exteriorization, when about fifty patients with colostomies which had been made in the treatment of battle injuries of the colon and rectum at overseas army medical installations came under his care. The management of these colostomy patients and a partial review of the literature constitute the basis of this paper. The author has had no experience with the initial treatment of battle injuries in the forward areas. It is, therefore, with understanding and realization of the difficulties encountered by surgeons in the front line regions, and the knowledge that hindsight is easier than foresight, that certain critical observations are made.

The wisdom of exteriorization of wounds of the colon was emphasized repeatedly during the late war. Ogilvie,⁹ in reviewing the results of surgery in the western desert, contended that the principle of exclusion of all damaged parts of the large intestine until repair is complete, applies to all injuries, even suspected ones, and to all parts of the bowel, particularly the extraperitoneal portion of the rectum. From directives and bulletins issued by the Surgeon General's Office, in which broad policies and guiding principles on the care of the wounded were presented, it can be learned that exteriorization of the injured bowel was considered the established procedure. Proximal colostomy was regarded as mandatory in the treatment of wounds of the rectum. Primary closure of wounds of the unprepared colon, as found in battle casualties, was deemed unwise and unsafe.

Ogilvie⁹ cited a case which is illustrative. Primary suture of a retroperitoneal tear of the descending colon, with drainage of the retroperitoneal region, was accomplished. Later a fecal fistula developed, and the patient died on the ninth day. Autopsy showed the wound of the colon to be broken down over a large area. Fecal matter lay free in the retroperitoneal tissues, and a severe general peritonitis was present. Comment by the surgeon was: "Suture alone seemed adequate; a proximal colostomy should have been made."

MINNEAPOLIS SURGICAL SOCIETY

The following case, which was among those observed by the author, also serves to illustrate the probable unwise choice of primary suture of a perforated colon rather than exteriorization.

The patient incurred a gunshot wound of the abdomen with the point of entrance in the right lumbar region and the point of exit in the left lower quadrant of the abdomen. At laparotomy ten hours after injury, a perforation 3 centimeters in diameter was found in the upper portion of the sigmoid colon. The perforation was closed. On arrival at an overseas general hospital, a fecal fistula was present in the lower left quadrant of the abdomen. The external opening of the fistula was the original wound of exit. At this hospital a loop colostomy of the transverse colon was made and multiple bone fragments were removed from the left ilium. After admission to a general hospital in this country, it was found that the patient had the following conditions: a fecal fistula, a poorly functioning loop colostomy of the transverse colon, compound comminuted fractures of the left ilium and sacrum with osteomyelitis of these bones, an atonic bladder, anal sphincter incompetence and partial paralysis of the left lower extremity. It was determined by x-ray examination, after lipiodol injection, that the fistula communicated with the upper sigmoid colon. Since the loop colostomy did not completely divert the fecal stream and therefore did not defunctionalize the distal bowel, revision of the transverse colostomy with separation of the stomata was done. Later, the perforated portion of the sigmoid colon and the fecal fistula were excised, and end-to-end anastomosis accomplished. The chronic osteomyelitis required drainage and sequestrectomy. The transverse colostomy was permitted to remain because of the incompetent anal sphincters. It is believed that exteriorization of the perforated portion of the sigmoid colon and the formation of a double-barrel colostomy at the time of the first laparotomy would have been the better procedure for this patient. Exteriorization would have prevented the formation of the fecal fistula and might well have lessened the severity of the osteomyelitis.

In reviewing the literature, it was found that authors who had had first-hand experience with battle injuries were almost without exception in favor of some type of exteriorization of all battle injuries of the colon. Horsley⁶ stated that there is no dispute concerning exteriorization of the wounded bowel. Mason⁸ followed the dictum, "exteriorize all colon injuries." Such strict adherence to the principle of exteriorization of all colon injuries may be debatable in civilian-type injuries. Hoffert reported at this society two cases of civilian-type injury to the colon in which exteriorization was employed with successful results in both cases.

Although there appears to be little or no argument concerning the value of exteriorization of battle injuries of the colon, there is considerable controversy over the methods of accomplishing the exteriorization, such as the technique involved and the type of colostomy to be employed. It is believed by some surgeons that the simple tube or loop colostomy, when properly performed, will completely shunt the fecal stream and defunctionalize the distal segment, while it is considered by others that the loop colostomy is inefficient and that complete defunctionalization of the distal bowel can only be obtained by forming a colostomy with separated stomata. It is felt by the latter that fecal material is bound to get into the distal bowel if the colostomy is covered by the same dressing. In observing the colostomies of

those patients which came under the author's management, it did not seem that there was always a clear understanding of the purpose of the operation at the time the colostomy was made. This was particularly true of proximal colostomies whose apparent intended purpose was to defunctionalize the distal bowel but, because of the technique used, could at best only decompress the bowel. Many of these patients arrived at the general hospital with the distal colon and rectum filled with feces. This was especially troublesome in those patients suffering from wounds of the buttocks and perineum which communicated with the rectum and which frequently were associated with compound fractures of the pelvic bones.

In order that a better understanding of the purpose of the operation can be acquired, Mason⁸ has grouped trauma of the colon as follows: (1) perforations of the antemesenteric portion up to one-half the diameter of segment; (2) perforations of the mesenteric and antemesenteric border larger than one-half of the diameter; (3) severely torn segments necessitating resection of a segment; (4) complete transections; (5) injuries to the mesentery producing nonviable segments; (6) the first five groups occurring in the rectosigmoid above the pelvic floor; (7) the same five groups occurring between the pelvic peritoneum and anus; and (8) injuries necessitating right colectomy or cecectomy. Using a classification of this type, the exteriorization of the bowel should be planned and the colostomy constructed, bearing in mind not only the simplest and easiest closure later but, what is more important, the real purpose of the exteriorization.

Ordinarily two types of colostomies are employed: (1) the tangential, simple, no-spur loop or tube colostomy and (2) the long, double-barrel colostomy with or without separation of the stomach. According to Mason,⁸ injuries of the colon fall in groups as stated above; and Groups 1, 6, and 7 should be treated by the simple, no-spur, loop colostomy. There is no question concerning the Group 1 injuries, since a loop colostomy will handle adequately the small antemesenteric or lateral perforations and lacerations. One question that a loop colostomy, no matter how performed, will completely defunctionalize the lower bowel and rectum in Groups 6 and 7 injuries. It is believed that the time would be well spent, providing the patient's condition permits, in constructing a colostomy which will completely defunctionalize the lower segment. This can only be accomplished by the formation of a colostomy with separated stomata, whether this be the Devine type or a no-spur colostomy with separated stomata necessitating end-to-end closure later. The usual double-barrel colostomy with approximated stomata will permit feces to gravitate from the proximal stoma to the distal stoma. Exclusion-type colostomies should be constructed, particularly for large intraperitoneal perforations or lacerations of rectum, where it is obvious a long time will elapse before healing and where secondary closure of the rectal wound will be necessary. Extensive damage to lower bowel segments, associated injury of bladder and urethra, and rectal injuries with compound fractures of the pelvis are examples of injuries which require a prolonged and complete defunctioning artificial anus. Un-

der these circumstances, the exteriorized loops should be made sufficiently long to allow for complete transverse section and some separation of the stomata. As ultimate closure will be by end-to-end suture, the formation of a spur is undesirable. The formation of a skin bridge between the arms of the loops might, in fact, be preferable.

The loop colostomy may be used for small perforations of the rectosigmoid, suspected perforations of the rectum, or when the patient's condition is such that the additional time required to construct a completely diverting type would greatly add to the risk of the operation. However, certain details in the formation of the loop colostomy, as recommended by Horsley,⁶ Mason⁸ and Fallis,³ should be observed. For exteriorizations or loop colostomies in the lower quadrants of the abdomen, short, laterally placed incisions which follow the direction of the fibres of the external oblique, similar to the McBurney incision, should be used. For colostomy of the transverse colon, a transverse incision through either rectus muscle, as advocated by Fallis,³ is indicated. The transverse incision will obviate the necessity of rotating the loops or twisting the bowel in its axis to permit delivery. Adequate mobilization without tension is extremely important in preventing retraction. It should be recalled that about one-half the diameter of the right colon, both flexures, and a portion of the rectosigmoid lie retroperitoneally, and that the lateral mesenteric attachments are for the most part avascular. Lateral incisions in the mesocolon can be made with impunity in procuring mobilization. Even with adequate mobilization there is a tendency for loop colostomies to retract. For this reason, a glass rod or rubber tube should be placed under the loop to be maintained in place for several weeks if necessary. Retraction causes the colostomy to degenerate into a useless fistula, which may be difficult to repair or may lead to intraperitoneal sepsis or abdominal wall abscess. The loop colostomy should be opened as soon as it is made, in the long axis of the antemesenteric border of the bowel, not necessarily in a longitudinal band. About two-thirds of the incision should be over the proximal loop and one-third toward the distal loop. The mesenteric border of the bowel will be undisturbed and will rest against the glass rod or tube. Often this type of colostomy can simply be closed by suturing the longitudinal incision transversely. The closed loop can then be placed extraperitoneally or intraperitoneally as seems most desirable.

Injuries of the colon falling in Groups 2, 3, 4 and 5 of Mason's⁸ classification should be treated by the construction of a double-barrel spur colostomy, according to Mason. This type of colostomy and exteriorization would permit extraperitoneal closure after crushing the spur. It was Mason's belief that exteriorization of these injuries without formation of a spur would result in a complicated procedure in re-establishment of the continuity of the bowel. This is contrary to the opinions of Keene⁷ and Hamilton and Cattanaeh,⁴ who prefer excision of the colostomy and end-to-end intraperitoneal closure as a one-stage procedure rather than the spur-crushing, extraperitoneal two-stage procedure. The author has, on several occasions, closed colostomies

intraperitoneally with excellent results and no untoward effects. As has been emphasized by Collier and Vaughn,³ Pemberton and Black,¹⁰ the peritoneal cavity will stand the contamination of intraperitoneal closure of a colostomy or open end-to-end anastomosis better than the abdominal wall tissues at the site of the colostomy.

Injuries of the ascending colon and cecum are extremely difficult to manage. Various exteriorizations procedures have been recommended. Tangential perforation of the cecum may be treated by tube cecostomy but preferably by exteriorization. Cecostomy, even when necessary because of direct injury, should never be used as a substitute for a proximal colostomy when indications are present for the latter. Extensive injuries necessitating resection of the cecum and ascending colon were treated by a number of different methods. In one method, after resection, a terminal ileostomy was created in a separate incision in the right lower quadrant, and the distal end of the colon was exteriorized below the costal margin. Occasionally an ileocolostomy was done and the distal end of the colon exteriorized as a colostomy. The formation of a double-barrel colostomy, one limb of which is the distal colon and the other limb the terminal ileum, has been suggested as another way of handling these injuries.¹ Such a combined proximated ileostomy and colostomy could be closed extraperitoneally after crushing the spur.

It would seem a simple matter to close a colostomy. However, the fairly large number of papers written on the closure of colostomies by authors with large experience attests to the fact that difficulties are encountered. It was the author's experience to find that a large number of colostomies were attended with complications or problems such as retractions, herniation of the bowel subcutaneously, interposed foreign bowel or mesentery between the colostomy loops, varying degrees of rotation of one limb of the colostomy around the other limb, secondary perforations or fistulae adjacent to the colostomy, and inflammatory or granulomatous masses involving the colostomy. These complications prohibited or precluded the use of the Paul-Miculicz technique or spur-crushing extraperitoneal closure. Excision of the colostomy, followed by intraperitoneal, open or closed, end-to-end anastomosis, was accomplished in these cases, with excellent results. Where a well-defined spur is present, the usual spur-crushing extraperitoneal closure can be used. Whatever method of closure is used, the contamination of the abdominal wall tissues should be handled either by delayed closure, as used by Collier and Vaughn³ and Pemberton and Black,¹⁰ or by subcutaneous drainage.

Summary

The value of exteriorization procedures for colon injuries is emphasized.

The techniques involved and the indications for the various methods of exteriorization are discussed.

When the intended purpose of the exteriorization procedure is defunctionalization of the distal bowel it is believed that a formal type of colostomy with separated stomata should be made, rather than a simple loop colostomy.

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Discussion

DR. ROBERT J. TENNER: Dr. Anderson has presented a very interesting and excellent discussion of the problem of colostomy and exteriorization procedures for colon injuries.

I would like to emphasize the importance of an exclusion type of colostomy. My experience in an Army General Hospital was very similar to Dr. Anderson's, and I saw several cases of chronic fecal fistulas which I believe would have been prevented if the colostomies which were established had completely diverted the fecal stream.

When it is deemed advisable to make a colostomy, whether for decompression in the case of an obstructing carcinomatous lesion or for protection of the sutured colon after repair of an injury, I feel the fecal stream should be diverted completely. I have seen colostomies which only partially diverted the fecal current, and I believe these were so constructed, in part at least, to facilitate the later closure of the bowel in a retroperitoneal or so-called aseptic manner. This aid to later closure of the stoma is no longer necessary, in my opinion, in that with the aid of chemotherapy plus the immunity present in these cases there is little or no risk or danger to the procedure of colostomy closure. At our hospital we closed over fifty colostomies. These closure cases were prepared for five days preoperatively with 15 to 20 gm. of sulfasuccidine daily, and then the stoma was closed and the wound sutured in layers. In some instances an extraperitoneal closure was done, but more often the colon was put back into the peritoneal cavity, free on its mesentery. All cases healed well and with no further difficulty. Therefore, I feel it is important to establish a completely exclusion type of colostomy in order to accomplish the main purpose at hand, in those cases where for any reason a colostomy is indicated.

There is a point I would like to mention in connection with the construction of a transverse colostomy when such a procedure is indicated. I feel it is advisable to make use of the protective properties of the omentum in these cases. An opening should be made in the omentum distal to its attachment to the transverse colon and by reaching through this opening, a loop of the colon can be delivered which will be surrounded by a collar of omentum. After the colon has been exteriorized and the wound closed, the omentum is in direct contact with the peritoneum of the anterior abdominal wall and thus seals off the peritoneal cavity from contamination and protects against possible herniation of the small intestine through the wound. Also when the colonic stoma is later closed, the omentum affords excellent protection against possible leakage which might occur at the suture line.

DR. HAMLIN MATTSO: Colon injuries constituted 22 per cent of all intra-abdominal visceral injuries in World War I. At Wakeman Hospital Center, most of our

colon surgery consisted in closing colostomies made overseas. We saw loop colostomies. I do not recall seeing one with separated stomata. We did end-to-end sutures and dropped the colon back into the peritoneal cavity. By this method better repair of the fascial hiatus is possible. The peritoneum is much better able to cope with infection than is the abdominal wall. The abdominal wall was drained. With chemotherapy and suction tubes in the lower small bowel, we are permitted greater boldness in colon surgery than heretofore.

We saw posterior colonic fistulas from bullet wounds through the ascending and sometimes descending colon where no mesentery is present. In the former it seemed best to do right hemicolectomy, while in fistulas from the descending colon the preferable procedure seemed to be repair of the colon after rotation, followed by a temporary transverse colostomy, Devine type.

DR. NATHAN C. PLIMPTON: I was very much interested in Dr. Anderson's paper and the comments. These men were at one end of the line while I was at the other. We often wondered what happened to the men we operated on, and my only follow-ups were a few scattered letters from some of my patients.

It is evident from what was presented here tonight that some colon injuries would have been better treated by an exclusion type of colostomy. In the European Theater of Operations, by directive, we did loop colostomies, and I think it is a good operation for most of the cases it was done on. Our group was about evenly divided between repairing the injuries to the colon and doing a proximal colostomy, and by exteriorizing the injured segment. I used to prefer the former when possible because I could delay the opening of the colostomy a day or so, thereby saving the wound from some contamination. Also, I preferred bringing my colostomies through a separate wound, usually a transverse incision when a transverse colostomy was done. One trick we employed when there was a single hole in the colon was to exteriorize that particular part of the bowel and repair it, with the hope that it would hold. Of course, it never did, but the wound was spared several days contamination. It was our feeling at the time these colostomies were done that, because the distal loop of the colon was already full of feces, it would not make much difference if there was some drainage from the proximal loop into the distal loop as long as we had performed a decompression.

Another argument for this procedure is that it is quick and simple, which is quite a factor when there is a backlog of ten to fifteen men in the preoperative tent who need abdominal and chest operations. I quite agree that all retroperitoneal wounds of the colon should be drained directly to the outside, in addition to the proximal colostomies. One thing we learned was that in the rather severe wounds of the rectum it is better to do a proximal transverse rather than a sigmoid colostomy, because in the final repair it might be necessary to mobilize enough sigmoid to anastomose it with the lower rectum, and if the latter procedure is done, it would add to the difficulty of the final operation.

DR. U. S. ANDERSON: Before this meeting, I tried to find someone who had served in a field or evacuation hospital to tell of his experiences in making these colostomies. I was unable to find anyone, and I am therefore glad that Dr. Plimpton has told us something about his experiences. All of us who were in general hospitals, both in this country and overseas, marveled at the excellent work of the surgeons in the field and evacuation hospitals. I did not wish to give the impression that all of the colostomies were made incorrectly. Many of them were made correctly, subsequently closed and the patients returned to duty. As I stated in my paper, I had had no first-hand experience with battle casualties, but believe I could understand and appreciate the many difficulties under which the surgeons in the forward areas worked.

◆ Reports and Announcements ◆

MEDICAL BROADCAST FOR FEBRUARY

The following radio schedule of talks on medical and dental subjects by William O'Brien, M.D., Director of Postgraduate Medical Education, University of Minnesota, is sponsored by the Minnesota State Medical Association, the Minnesota State Dental Association, the Minnesota Hospital Service Association in co-operation with the Minnesota Hospital Association and the Minnesota Nurses Association, and the University of Minnesota School of the Air.

1	11:30 A.M.	KUOM-KROC-KFAM	Medicine in the News
4	4:45 P.M.	WCCO	Hospitals for Mental Disease
5	11:00 A.M.	KUOM	Your Body Needs Regular Exercise
7	4:45 P.M.	WCCO	Social Hygiene
8	11:30 A.M.	KUOM-KROC-KFAM	Medicine in the News
11	4:45 P.M.	WCCO	The School Nurse
12	11:00 A.M.	KUOM	Rest and Sleep Renew Our Bodies Daily
13	4:45 P.M.	WCCO	National Heart Week
15	11:30 A.M.	KUOM-KROC-KFAM	Medicine in the News
18	4:45 P.M.	WCCO	Progress in Maternal and Infant Care
19	11:00 A.M.	KUOM	Your Nervous System Directs Your Life
20	4:45 P.M.	WCCO	Cause of Accidents
22	11:30 A.M.	KUOM-KROC-KFAM	Medicine in the News
25	4:45 P.M.	WCCO	On Becoming a Nurse
26	11:00 A.M.	KUOM	We Can Grow Old and Be Well
27	4:45 P.M.	WCCO	Injuries of Mouth and Teeth

AMERICAN CONGRESS ON OBSTETRICS AND GYNECOLOGY

The program of the Third American Congress on Obstetrics and Gynecology, to be held September 8-12, 1947, in St. Louis, will feature general sessions for all groups making up the congress as well as smaller individual group meetings and round-table discussions. The morning sessions will be panel-type presentations of the following subjects: September 9, Anesthesia and Analgesia; September 10, Cancer; and September 11, Cesarean Section.

The afternoon meetings of the medical section of the congress will consider on September 9, Psychosomatic Aspects of Pregnancy; on September 10, Pregnancy Complicating Cardiac Disease, Diabetes and Tuberculosis; and on September 11, Recent Advances in Endocrinology.

Round-table discussions from four to five o'clock daily will consider such topics as etiology of abortion, asphyxia, fibroids, prolonged labor, infertility, early ambulation, adolescence, treatment of abortion, genital relaxation, ovulation, the menopause, the cystic ovary, uterine bleeding, nutrition in pregnancy, geriatric gynecology, endometriosis and erythroblastosis.

Concurrent sessions and round tables for nurses, hospital administrators and public health workers are being arranged.

The popular forceps and breech demonstrations, that

attracted so much attention at the second congress in 1942, will be increased in number so that eighteen demonstrations per day will be held, six each at nine, one and five o'clock daily.

A large scientific and educational exhibit is being set up under the direction of Dr. J. P. Pratt of Detroit, and a comprehensive motion picture program is being arranged by Dr. John Parks of Washington, D. C. The committees assisting these doctors will review applications by prospective participants late this spring. Anyone wishing to make application for space in the scientific exhibit or for time on the motion picture program may obtain the proper blanks from the office of the congress at 24 West Ohio Street, Chicago 10, Illinois.

SECOND SOUTH AMERICAN CONGRESS OF NEUROSURGERY

The second South American Congress of Neurosurgery will be held in Santiago, Chile, April 21-27, 1947. Subjects which will receive special attention include Hydrocephalus, Histology in Brain Tumors (Gliomas and Paragliomas) in Relation to Clinical Findings, and Brain Abscess.

As the meeting is sponsored by the Chilean government, embassies and consulates of Chile have been instructed to grant free visas to those wishing to attend and to extend maximum facilities for obtaining the necessary travel permits.

The registration fee of \$18.00 (United States) includes the cost of a copy of the Proceedings of the Congress.

Copy of the program and further information may be obtained from Dr. Carlos Villavicencio, Instituto de Neurocirugia y Neuropatologia, Casilla 70, Santiago, Chile.

EXAMINATIONS FOR APPOINTMENT TO REGULAR CORPS. USPHS

Competitive written examinations for appointment to the Regular Corps of the USPHS to fill some seventy-five vacancies will be held on April 14 and 15, 1947, at various locations. The oral examinations will be held from February 13 to April 9 in strategically located cities. One of these is Minneapolis and the date set is February 27.

Commissions are available to scientists trained in bacteriology, mycology, parasitology, entomology, biology, chemistry, physiology, physics, psychology, et cetera. Salary for assistant scientists is \$3,811, and for senior assistant scientists, \$4,351 with allowance for dependents.

Application forms and additional information can be obtained from the Surgeon General, USPHS, Washington 25, D. C.

(Continued on Page 206)

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RESEARCH IN THE SERVICE OF MEDICINE

WOMAN'S AUXILIARY

STATE BOARD MEETING

The fall board meeting of the Woman's Auxiliary to the Minnesota State Medical Association was held at the University Club in Saint Paul, Friday, December 6, 1946.

Mrs. Jesse D. Hamer, Phoenix, Arizona, president of the Auxiliary to the American Medical Association, was present and brought a very interesting message to the board members. A luncheon followed the business meeting.

Hennepin County

On December 6, 1946, the Hennepin County Auxiliary held its annual Christmas tea in the Medical Arts lounge. Mrs. Jesse D. Hamer, Phoenix, Arizona, national president, and Mrs. Melvin S. Henderson, Rochester, state president, were guests of honor.

Mrs. Leonard Arling read "The First Christmas Tree," and Mrs. Elmer O. Dahl and Mrs. Arthur A. Wohlrahe were tea hostesses.

A luncheon was given at the Radisson Hotel, January 3, 1947.

Mr. E. C. Peterson of the Baker Peterson Floral Company gave a demonstration of floral arrangements.

Mrs. Gerald M. Koepke made the luncheon arrangements and Mrs. C. A. Boreen was hospitality chairman.

Mower County

The Mower County Auxiliary met Monday, December 30, 1946, at the home of Mrs. J. K. McKenna, with eleven members present.

Mrs. H. B. Allen presided as Mrs. P. C. Leck gave an interesting outline of the Christmas seal work. She traced the progress of the seal from its origin in 1903 in Denmark to its present date. She told how in 1904 the National Tuberculosis Association was organized to study tuberculosis in all its forms, to spread knowledge as to its causes, treatment and prevention.

The Auxiliary voted to purchase a \$5.00 tuberculosis bond.

Luncheon followed the meeting.

Red River Valley

The Red River Valley Medical Auxiliary met Tuesday evening, January 7, 1947, at the home of Mrs. O. K. Behr, Crookston. Mrs. M. O. Oppegard, president, presided at the business meeting which was followed by several tables of bridge.

Mrs. J. P. Anderson of Red Lake Falls was the high-score prize winner. The out-of-town guests were Mrs. W. E. Anderson of Clearbrook and Mrs. C. H. Holmstrom and Mrs. M. J. Bechtel of Warren.

Refreshments were served by Mrs. Behr.

The meeting followed the annual banquet held in the Red and Gold room of Hotel Crookston, attended by members of the Red River Valley Medical Association and the Auxiliary.

Waseca County

Dr. and Mrs. Clifford Wadd of Janesville entertained the members of the Waseca County Medical Society and their wives at a dinner at Hotel Waseca, January 7, 1947.

At the business meeting of the auxiliary, held after the dinner, the following officers were elected: President, Mrs. B. J. Gallagher, Waseca; Vice President, Mrs. Ray Hottinger, Janesville; Secretary-Treasurer, Mrs. R. D. Davis, Clearbrook.

Winona County

Winona County Auxiliary members attended a dinner with their husbands Monday evening, January 6, 1947, at the Winona Hotel, Winona, Minnesota. A business meeting followed the dinner.

REPORTS AND ANNOUNCEMENTS

(Continued from Page 204)

MINNESOTA PATHOLOGICAL SOCIETY

The regular meeting of the Minnesota Pathological Society was held in the Medical Science Amphitheater of the University of Minnesota Medical School on January 21, at 8:00 p.m. The featured address, "Rehabilitation Following Semi-starvation in Man," was given by Dr. Ancel Keys.

UNIVERSITY GRADUATES AVAILABLE FOR ASSISTANTSHIPS

The University of Minnesota Medical School is graduating a senior class on August 29, 1947. Some of these young physicians have expressed an interest to engage in further training on a preceptorship basis or to serve as office assistants for periods of from three to nine months pending the beginning of regular internships.

Any physician in Minnesota or in the midwest who is interested to discuss such an arrangement with students at the University of Minnesota Medical School may correspond with Dr. M. M. Weaver, Assistant Dean and Secretary of the Committee on Internships, University of Minnesota Medical School.

WASHINGTON COUNTY

The Washington County Medical Society was addressed at its January 14, 1947, meeting by Dr. Karl H. Pfuetze, director and superintendent of the Mineral Spring Sanatorium. Chest x-rays of some eighty-eight high school students, teachers and janitors who had had positive Mantoux reactions were interpreted.

Medicine is the only profession that labors incessantly to destroy the reason for its own existence.—LORD BRYCE.

In Memoriam

HARRY WINSLOW ALLEN

Dr. H. W. Allen of Minneapolis passed away on December 28, 1946, following a year's illness.

Dr. Allen was born at Bath, Maine, on July 10, 1872. He lived in Red Wing, Minnesota, before attending the University of Minnesota, from which he received B.S. and M.S. degrees in 1895 and his M.D. degree in 1900.

He was a member of the Hennepin County Medical Society, the Minnesota State and American Medical Associations, and a staff member of St. Barnabas Hospital. For many years he was medical examiner for the Claim Department of the Minneapolis and St. Louis Railway.

Dr. Allen is survived by his wife and a sister, Mrs. George Murfin, Lake Minnetonka.

GEORGE RALPH CHRISTIE

Dr. George Ralph Christie, of Long Prairie, died in Asbury Hospital in Minneapolis on January 20, 1947, in his eighty-seventh year.

Dr. Christie had practiced medicine at Long Prairie for sixty years. He was born in 1858 and graduated from the University of Illinois in 1882. Although he retired some years ago, he continued to be prominent in local business and civic affairs and was well known in Minneapolis.

His immediate survivors are three sons; Dr. Robert of Long Prairie, George W., editor of the Red Lake Falls Gazette; and Donald R., of Perham.

Funeral services were held on Wednesday, January 22, at 2 p.m. and interment was at Long Prairie.

DONALD MICHAEL DECOURCY

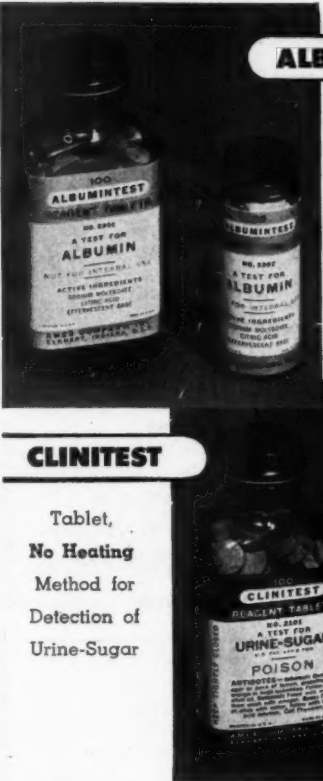
Dr. Donald Michael DeCourcy was born in Saint Paul, on March 3, 1902, and died suddenly on May 28, 1946. He was buried in St. Mary's cemetery, Minneapolis.

He attended St. John's grade school on Dayton's Bluff and later graduated from St. Thomas Military Academy, Saint Paul. While at St. Thomas College, where he took his pre-medical course, he played half-back in football, played hockey, was Minnesota State collegiate singles champion in tennis. In 1919 he won the Colonel Perkins silver tennis trophy and was Saint Paul city tennis champion in 1922 and 1925. He graduated from Marquette Medical School in 1929, and while there he played defense on Marquette's undefeated hockey teams of 1927 and 1928, who were the Northern Collegiate Champions. He earned a place for himself in Marquette's Hockey Hall of Fame.

He interned at St. Joseph's Hospital, Saint Paul, from 1929 to 1930. He maintained an office on Dayton's Bluff since his graduation and was affiliated with the Veterans Hospital, where he served in the capacity of orthopedic surgeon. He was on the staffs of Mounds Park, St. John's and St. Joseph's Hospitals. He was

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MINNEAPOLIS

a member of the Minnesota State and American Medical Associations, and the Ramsey County Medical Society. He was also a member of the Phi Chi medical fraternity.

He is survived by his wife, Elizabeth Talbot DeCourcy, whom he married on June 19, 1937, and two sons, Donald Michael, Jr., and Michael Talbot DeCourcy, who was born about one hour after his father's death.

JAMES WILSON, M.D.

DOMINICK PATRICK DEMPSEY

Dr. Dominick P. Dempsey of Wabasha died November 30, 1946, at the age of seventy-six.

He was born at Clermont, Iowa, on September 9, 1870. After receiving a B.S. degree from Valparaiso University in 1903, he obtained his medical education at Creighton Medical School in Omaha, graduating in 1906. He interned at St. Mary's Hospital in Minneapolis and opened an office in Kellogg, Minnesota, and in Wabasha in conjunction with Drs. Lester and Doherty in 1907.

Dr. Dempsey was a member of the Wabasha County Medical Society, the Minnesota State and American Medical Associations.

He is survived by a sister who lives in Dubuque, Iowa, and several nephews and nieces in Iowa and Nebraska.

JOHN JOSEPH EDERER

Dr. John J. Ederer, formerly of Mahnom, Minnesota, passed away December 11, 1946, in Minneapolis, following a heart attack, after an illness of almost two years.

He was born at Morton, Minnesota, on March 9, 1905. After attending North Dakota University for two years, he took his medical course at the University of Minnesota, graduating in 1930. His internship was served at the United States Marine Hospital in New York. At one time he practiced in Morris and Bellingham, Minnesota, and was an army physician from 1934 until 1936.

Dr. Ederer owned and operated the Mahnom Hospital at Mahnom, Minnesota, for four years before retiring in 1944. He was a member of the Red River Valley Medical Society and served as examining physician for the Selective Service for a period of four years in Mahnom County. He was elected president of the Mahnom Golf Club in 1939.

Dr. Ederer is survived by his wife, Celeste, and two sons, John H. and Paul F. Ederer.

HENRY B. GRIMES

Dr. H. B. Grimes of Madelia, Minnesota, died July 18, 1946, at the age of sixty-nine.

He was born in Mansfield, Ohio, on September 8, 1877. He received his medical degree from the University of Michigan in 1903 and interned at St. Mary's Hospital in Rochester, Minnesota.

After practicing at Lake Crystal, Minnesota, from 1904 until 1911, he moved to Madelia. In 1918 and 1919 he served as captain in the Medical Corps of the army and later was a major in the army medical reserve.

MINNESOTA MEDICINE

IN MEMORIAM

Dr. Grimes was a member of the Watonwan County Medical Society, the Minnesota State and American Medical Associations, and the Southern Minnesota Medical Association.

ELEANOR JANE HILL

Dr. Eleanor J. Hill of Minneapolis, one of the first women graduates of the University of Minnesota Medical School, died December 12, 1946, at the age of seventy-eight.

Dr. Hill was born at Rockwood, Ontario, August 1, 1868. She received her M.D. degree in 1902 and interned at the State Hospital for the Insane at Jamestown, North Dakota, staying there from 1902 until 1907.

She was head of the prenatal clinic at the Northeast Neighborhood House, school physician for the Minneapolis Board of Education, and was a member of the staff at Asbury and Northwestern Hospitals. She was also a member of the Hennepin County Medical Society, the Minnesota State and American Medical Associations.

Dr. Hill is survived by a sister, Mrs. Abbie A. Pearce of Minneapolis, and two brothers, Charles F. Hill, Ontario, and George A. Hill, Jersey City, New Jersey.

ARNOLD PLANKERS

Dr. Arnold Plankers of Saint Paul died December 26, 1946, at the age of sixty-two.

He attended Central High School and Hamline University, Saint Paul, and the University of Minnesota, where he played football. He received his medical degree from Creighton University in 1910, and a few years later began practice in Saint Paul.

CHARLES E. REMY

Dr. Charles E. Remy, superintendent of the Minneapolis General Hospital from 1930 to 1937, died December 16, 1946, at the Wesley Memorial Hospital in Chicago.

After leaving Minneapolis in 1937, Dr. Remy was associated with the Knickerbocker Hospital in New York.

JESSE LYNN MACBETH

Dr. J. L. Macbeth of St. Clair, Minnesota, died November 19, 1946, at the age of sixty-six, following a lingering illness.

Dr. Macbeth was born in Tivoli township, Minnesota, June 20, 1880.

He received his medical education at Fort Wayne Medical College, graduating in 1905, and began practice in St. Clair in 1906. In 1920 he married Sadie Eaton of Mankato.

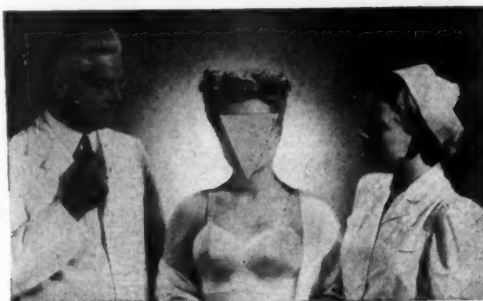
Dr. Macbeth was a member of the Blue Earth County Medical Society and the Minnesota State and American Medical Associations.

He is survived by his widow, by three brothers, Walter and George, of Mankato, and Dr. A. H. Macbeth, Fort Wayne, Indiana, and by three sisters, Mrs. Nellie Redner and Mrs. Mary Britt, of North Dakota, and Mrs. Carrie Britt, Eagle Lake.

FEBRUARY, 1947

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VICTOR E. VERNE

Dr. Victor E. Verne, brother of the late Dr. Paul C. Verne of Minneapolis, died December 1, 1946.

Dr. V. E. Verne was born in Minneapolis, March 2, 1883. He graduated from the University of Minnesota Medical School and was a member of the Nu Sigma Nu medical fraternity.

He began practice at Parkers Prairie in 1906 and became associated with Dr. O. J. Hagen in Moorhead, Minnesota, in 1910. In 1914 he established his own office. In 1918 he joined the Medical Corps of the army and was later discharged as a captain.

In 1922 Dr. Verne moved to Long Beach, California, where he had since practiced.

Dr. Verne is survived by his wife and two children.

Communication

St. Cloud, Minnesota

November 27, 1946

Re: Our Forgotten Children

Dear Dr. Drake:

I am writing to you, the editor of MINNESOTA MEDICINE about a matter which I feel is important. If, when I get through telling you my story, you too feel that it is worthwhile, perhaps you would like to write an article for your MINNESOTA MEDICINE regarding it.

Minnesota has many good public, private and parochial schools which take care of the educational needs of most of the children of our state. There is, however, a group of children, which up until now, has received very little attention. I refer to the homebound crippled children of our state. The reason for this neglect, I believe, is not that people have not been interested in them, but rather, because the cases are scattered and people have not known about them. It is therefore up to some of us who do know what the situation is, and what the possibilities are, to do what we can to see that life is made as normal and satisfying as possible for these deserving children. This, among other things, includes the opportunity to get an education.

St. Cloud has been the pioneer in this field of effort, and is the only city in Minnesota which has in operation at the present time Home School for Shut-in Crippled Children, conducted through its public schools. Minneapolis has just recently begun operations to provide Home School for its shut-in crippled children.

As long as 1935, the school authorities of St. Cloud recognized the needs and rights of physically handicapped children of our city and mapped out a program of education for them. The work was first carried out through a WPA project, which was planned and supervised by the public schools, with the actual home school work being carried out by WPA teachers. When WPA was discontinued, interested members of the St. Cloud Public Schools Administration collected information from other states concerning the operation of classes for their physically handicapped children and finally, in 1943, wrote a bill which they presented before the Minnesota State Legislature. It was supported by many interested civic and education groups. The bill was passed and became a law. Ever since that time our home classes for physically handicapped children have operated under the new law, with expenses of operation being born by the state. Though this law has been in operation in Minnesota since 1943, no other school district outside of St. Cloud, and now Minneapolis, has availed itself of its opportunities.

COMMUNICATION

The question is, should there not be many more classes for home-bound physically handicapped children in operation in various public school systems scattered throughout the State of Minnesota, to care for our handicapped children? Included in this group are heart cases, spastic cases, rheumatic fever cases, polio cases, and crippled children. Could not a little teamwork and publicity work on the part of doctors, school superintendents, and our State Department of Education bring education to these deserving children? The machinery to do the job is already set up and ready to go, but it isn't being used. Can't we do our bit to give these deserving youngsters the same break that normal children have? Why add a mental handicap to the physical handicap which they already have to bear?

Would you care, Dr. Drake, to bring this problem to the attention of the doctors of the state, through your MINNESOTA MEDICINE, urging them to call to the attention of their superintendents of schools the physically handicapped children of their town, who are being denied an education, just because they can't go to school and get it? I am also at this time writing to the Editor of our *Minnesota Education Journal*, in an effort to bring this matter to the attention of the superintendents and teachers of our state. They seem not to know that a law has been passed to take care of these children. All we need is a little understanding and teamwork and the job can be done. If the doctors will report the cases to the school superintendents and the school superintendents will write to the State Department of Education for permission to set up Home Teaching, the State of Minnesota has already said it would pay the bill. Simple, isn't it?

Thank you very much for anything you may care to do about the matter.

Sincerely,
MARTHA VAN BRUSSEL,
Grade Supervisor

* * *

EDITOR'S NOTE: The above letter from Miss Van Brussel calls attention to the provision, by the state, for free home instruction of crippled children of school age unable to attend school or the special public school classes. In Minneapolis the Dowling School and in Saint Paul the Lindsay School for crippled children provide special instruction and free transportation for handicapped children who are able to take advantage of these special schools. In the cities and country districts, there are many additional youngsters who are confined to their homes and, therefore, unable to acquire an education. These children are known to physicians.

If physicians would report the names of such children to the Board of Education of the local school district, and the Board in turn would report to the Special Class Section of the State Department of Health the names of five or more children living near enough to each other to make visiting by a teacher practical, something might be accomplished.

In order to qualify for such home instruction, each child must be provided with a certificate from a qualified physician, stating the nature and extent of the disability and that the child is one so "deformed or impaired in body or limb" as to be unable to attend special school classes with other children. As home enrollment has a tendency to increase each year, the state reserves the right to require yearly examination of those enrolled.

St. Cloud was the instigator of this worthy movement, and Minneapolis has just recently taken advantage of the provisions of the 1943 law. The rest of the state might well get in line.

FEBRUARY, 1947

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◆ Of General Interest ◆

Dr. James J. Kolars opened offices for the practice of medicine and surgery in Faribault on January 1.

* * *

"Recent Advances in Medicine" were discussed by Dr. Martin O. Wallace, Duluth, at a recent meeting of the local Kiwanis Club.

* * *

Dr. Allan G. Janecky, formerly in practice at Thief River Falls, but more recently located at Monroe, Louisiana, has entered general practice at Warroad.

* * *

Announcement has been made of the termination of the partnership of Dr. James A. Sanford and Dr. Anthony H. Field, in Farmington, effective January 1, 1947.

* * *

Dr. Edward H. Juers, of Red Wing, was guest speaker at the December meeting of the Saint Paul Surgical Society held at the University Club. Dr. Juers' subject was "Pulmonary Thrombosis of the Axillary Vein."

* * *

Dr. Hugh Patterson, of Slayton, is holding office hours three forenoons during the week at Lake Wilson—Tuesday, Thursday and Saturday—in order to provide the residents with at least partial medical service.

* * *

Dr. Gordon R. Kamman, of Saint Paul, was the featured speaker at the meeting of the Webster County Medical Society held at Fort Dodge, Iowa, on January 16, 1947. Dr. Kamman's subject was "Psychomatic Diagnosis."

* * *

Dr. Dean Affleck, formerly of Grand Rapids, has resumed his practice at Twin Falls, Idaho, where he had been located for nine years prior to entering military service. Dr. Affleck took his medical degree at the University of Minnesota.

* * *

The practice of the late Dr. G. B. Cross at Lakeville has been taken over by Dr. Paul Wagner, effective January 6. Dr. Wagner was only recently released from military service. He is a graduate of the University of Minnesota School of Medicine.

* * *

Recent experimental use of streptomycin in the treatment of tuberculosis was discussed by Dr. Horton C. Hinshaw, of the Mayo Foundation, in the auditorium of the Natural History Museum at the University of Minnesota on Tuesday evening, January 14.

* * *

CORRECTION

Due to a typographical error, the wrong dosage was given in the last line in the case summary of the article on Epilepsy which appeared on Page 50 of the January issue. The line should read: Dilantin sodium, 0.1 gm. twice daily, was prescribed.

Dr. Hartvig Roholt, son of Dr. and Mrs. Christian L. Roholt, of Waverly, received his medical degree at the mid-year commencement at the University of Minnesota. Dr. Roholt is completing his internship at the Milwaukee County Hospital, Milwaukee, Wisconsin.

* * *

Dr. Haddow M. Keith, of the Mayo Clinic, has been in New York City for a meeting of the American League Against Epilepsy and the Association for Research in Nervous and Mental Disease. Dr. Keith, who has been vice president of the League, was elected president for the current year.

* * *

Dr. Charles E. Turbak has taken over Dr. Charles E. Baker's offices and practice in Herman.

Dr. Baker, who moved to Fergus Falls some months ago, had been holding office hours in Herman several days each week until a permanent medical practitioner could be secured.

* * *

A portrait in oils of the late Dr. Franklin Raiter, of Cloquet, has been hung in the local hospital. The unveiling, which was held on December 24, was witnessed by men, women and children from all walks of life, representative of the patients to whom Dr. Raiter had given a devoted service.

* * *

Dr. Marland R. Williams, Cannon Falls, has been joined in practice by Dr. Harold J. Anderson, formerly of Saint Paul. Dr. Anderson, a graduate of the University of Minnesota Medical School, was recently discharged from military service, where he was a surgeon in the Army Air Corps.

* * *

Dr. William B. Halme is now associated in practice with Drs. Reino H. Puumala and Marie K. Bepko at the new Cloquet Medical Center. Dr. Halme, who is a former resident of the Kettle River-Automba community, was recently appointed a member of the courtesy staff of St. Luke's Hospital, Duluth.

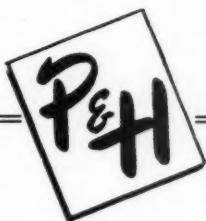
* * *

Dr. Allan E. Moe has completed his three-year fellowship in Internal Medicine at the Mayo Foundation and received an M.S. degree in science from the University of Minnesota at the December commencement. After February 1, 1947, Dr. Moe will be associated with the Fargo Clinic at Fargo, North Dakota.

* * *

Dr. Frank Falsetti, of Rochester, who was recently released from the Army Medical Corps, is taking post-graduate work at the University of Minnesota School of Medicine. At the time of his induction into military service in 1944, Dr. Falsetti had an orthopedic residency at St. Vincent's Hospital in Toledo, Ohio.

(Continued on Page 214)



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OF GENERAL INTEREST

(Continued from Page 212)

Dr. James Chessen, formerly of Duluth, has been awarded a fellowship by the American College of Surgeons. Dr. Chessen, who is in practice in Denver, Colorado, is a member of the faculty of the University of Colorado School of Medicine and consultant to the Denver University Student Health Department.

* * *

Mid-year commencement at the University was a very special occasion for Dr. and Mrs. Denton Engstrom, of Minneapolis. Dr. Engstrom, who has been studying under the Army Training Program and interning at St. Barnabas Hospital, received his medical degree, and Mrs. Engstrom received a B.S. degree as a medical technician.

* * *

The Minnesota Society of Neurology and Psychiatry held a regular monthly dinner meeting at the Saint Paul Town and Country Club on January 14 at 6:30 p.m. The guest speaker was Dr. Barnard J. Alpers, professor of neurology at Jefferson Medical College. Dr. Alpers' subject was "The Correlation, by Pathological Studies, of Retinal and Cerebral Arteriosclerosis."

* * *

Dr. Alfred H. Wolf, Harmony, has taken over the Minneapolis practice of his brother, the late Dr. William W. Wolf, and will locate there permanently. Until another physician can be secured for Harmony, Dr. Wolf will keep office hours there every Saturday afternoon and evening.

Dr. William Wolf died unexpectedly on December 14.

* * *

Dr. Howard Gray, of the Mayo Clinic, has returned from the East where he attended the meeting of the American Board of Surgery in Philadelphia and addressed the Luzerne County Medical Society at Wilkes-Barre on "Problems Associated with Surgery of the Biliary Tract." While away Dr. Gray attended the Clinical Congress of the American College of Surgeons in Cleveland and participated in a panel discussion on surgery of the stomach.

* * *

Dr. Paul Gamble was elected president of the Freeborn County Medical Society at the annual meeting held at the Hotel Albert in Albert Lea in December. Other officers elected at this time were: vice president, Dr. Leo Prins; treasurer, Dr. Ernest S. Palmerston; secretary, Dr. Paul Persons.

The business meeting, which was conducted by Dr. Daniel L. Donovan, the retiring president, was preceded by dinner at 7:00 p.m.

* * *

Announcement has been made of the following fellowship awards by the American College of Surgeons to Minnesota men: Drs. Everett B. Coulter, Earl H. Dunlap, Paul N. Larson, Reinhold M. Erickson, John R. Paine and Wesley G. Schaefer, all of Minneapolis; Dr. David P. Anderson, Jr., Austin; Dr. Rochfors W. Kearney, Mankato; Dr. Donovan McCain, St. Paul; Dr. Anthony J. Spang, Duluth; and Drs. William H. Bickel, George T. R. Fahlund, Fred Z. Havens, Paul Z. Kiernan and Howard H. Lander, all of Rochester.

With his resignation as city health officer and county coroner in January, Dr. James H. Haines, Stillwater, terminated more than thirty years of public service.

Dr. Haines, who is a graduate of Rush Medical College, Chicago, came to Stillwater in 1895, shortly after receiving his degree. He served as superintendent of the City Hospital for two years, then entered private practice, in which he continued until forced to retire recently because of ill health.

* * *

Dr. Robert Elman, associate professor of surgery, Washington University, St. Louis, Missouri, was guest speaker at the meeting of the Hennepin County Medical Society on Monday, January 6, in the Medical Arts Building. Dr. Elman appeared under the joint auspices of the Medical Society and the Minneapolis Surgical Society.

The business session included nomination of officers for 1947-48.

* * *

Dr. Wilfred M. Akins, now of Red Wing but formerly associated with the More Hospital and Clinic at Eveleth, was guest of honor at a dinner for 150 Minneapolis YMCA campers and their fathers given at the Y's year-round camp—Camp Iduhapi—at Lake Independence.

Dr. Akins, who was located in Eveleth for many years, served as camp doctor at Camp Warren which was operated by the YMCA south of Eveleth.

* * *

Dr. Paul Reed has joined the Lenont-Peterson Clinic at Virginia, Minnesota. Dr. Reed, who is a native of Virginia, is a graduate of the University of Minnesota School of Medicine. Following the completion of his internship at the Minneapolis General Hospital in 1937, he entered practice at Langdon and Rolla, North Dakota, where he remained until enlisting in the U. S. Navy in 1942. Dr. Reed was in service for four years and at the time of his separation was lieutenant commander.

* * *

Dr. Duncan E. Luth, Duluth, was guest speaker at a recent meeting of the West Duluth Women's Club. Dr. Luth's subject was India and Burma, on which he is qualified to speak, having been on military assignment in the China-Burma-India Theatre for fourteen months. Dr. Luth, who was in the Army Medical Corps for almost four years, served as group flight surgeon and chief of obstetrical service of the Romulus Air Base. Later Dr. Luth was assigned as surgeon for the Bengal Wing in Burma and was placed in charge of all medical activities at the Ninth Air Base.

* * *

Dr. Jay A. Myers, professor of Public Health and Medicine at the University of Minnesota, is now associated with five major health groups concerned with the study and treatment of tuberculosis. He is general chairman of the Research Council of the American Chest Physicians; a committee member of the National Tuberculosis Association; a member of the recently established subcommittee of the National Research Council; a member of the committee in the Division

OF GENERAL INTEREST

of Tuberculosis, U. S. Public Health Service, and a member of the Tuberculosis Therapy Study Section of the National Institute of Health.

* * *

Dr. H. H. Perman, formerly of Moorhead, has purchased Dr. P. W. Demo's practice at Wells, taking over about the middle of January.

Dr. Perman took his medical degree at Washington University in St. Louis. On the completion of his internship at the Minneapolis General Hospital, he entered the U. S. Navy Medical Corps. Since his separation from service six months ago, Dr. Perman has been house surgeon at Abbott Hospital in Minneapolis.

Dr. Demo has re-entered the navy medical service and is now on assignment at the Naval Hospital at Bainbridge, Maryland.

* * *

Dr. Lawrence F. Richdorf, Minneapolis, has been appointed co-chairman with Douglas Misfelt, Saint Paul, of the American Legion Child Welfare program.

A major activity of this committee will be a campaign to raise funds for a permanent professorship in rheumatic fever and research to operate in conjunction with the projected Variety Club Heart Hospital at the University of Minnesota.

Dr. Richdorf attended the Legion's Area D Child Welfare Conference held in Omaha, January 9 through 11, when an appeal was made to other Legion organizations throughout the country for assistance in establishing the proposed professorship.

Dr. G. Arvid Hedberg, superintendent of Nopeming Sanatorium, has announced the appointment of Dr. Reno W. Backus as associate medical director to succeed Dr. Robert Davies, who resigned to take a position in Seattle.

Dr. Backus is a graduate of Rush Medical College, Chicago. He was superintendent of the Methodist Hospital in Peking, China, for fourteen years and while there organized a 100-bed tuberculosis sanatorium. Returning to the United States in 1941, he joined the staff of McGregor Sanatorium in New York. Later he was associated with Glen Lake Sanatorium in Minneapolis, and has been on the staff at Nopeming since July 1, 1943.

* * *

Dr. Ralph Larson, who has been associated in practice with Dr. Marvin R. Williams at Cannon Falls for the past year, has opened offices at Anoka and purchased a home there.

Dr. Larson is a 1940 graduate of the University of Minnesota Medical School. He served his internship at the Orange County, California, General Hospital, then entered private practice. A short time later he was inducted into the Army Medical Corps. As a battalion surgeon he served in England for two years and took part in the invasion of Normandy, where he was wounded and evacuated to England. At the time of his discharge, Dr. Larson had completed fifty-two months of military service.

* * *

Dr. Ernest F. Cowern, North Saint Paul, was guest of honor at an "appreciation party" sponsored by Fellowship Lodge, AF and AM, and members of the East-



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OF GENERAL INTEREST

ern Star during the Christmas holidays in recognition of Dr. Cowern's forty-three years of service to the community. Among the 400 persons who attended were many of the 1,360 babies Dr. Cowern has delivered since coming to North Saint Paul in 1903.

Dr. Cowern graduated from Dartmouth in 1902 and practiced for a short time in Vermont and New Hampshire before coming to North Saint Paul. He has been local school physician for many years and still is "on the job."

* * *

Dr. Kenneth A. Peterson, formerly of Saint Paul, has opened offices in association with Dr. Frank D. Gray, of Marshall.

A graduate of the University of Minnesota Medical School, Dr. Peterson interned at the Minneapolis General Hospital and was resident physician at the Midway Hospital in Saint Paul for the two years prior to his entry into the army. His military assignments included duty at Northington General Hospital in Tuscalusa, Alabama—a neurosurgical, orthopedic and plastic surgery center—and the Regional Hospital at Fort McClellan, Alabama, where he was chief of the outpatient department. Dr. Peterson was separated from service last fall.

* * *

Eighteen new members, fourteen of them veterans of World War II, were admitted to the Hennepin County Medical Society at the meeting on January 6.

The veterans were: Drs. Eugene Edward Aherne, Evrel Arthur Larson, Howard Martin Frykman, How-

ard Hoffman Groszkloss, Donald Ernest Otten, George Werner, Gordon Strom, Vincent Frances Swanson, John Patrick Kelly, Donald Richard Reader, John Lowell Stennes, Eric Kent Clarke, Stanley Guy Law and Clifford Orvis Erickson.

Other new members are Drs. Helen Robertson Haber, John Jacob Kaplan, Raymond E. Buirge, and Donald John Erickson.

* * *

Dr. T. S. Eberley, formerly of Anoka, has entered practice at Benson. A 1937 graduate of St. Olaf College, Northfield, Dr. Eberley took his medical degree at the University of Minnesota in 1941. He served his internship at the Minneapolis General Hospital, then entered the Army Air Force, where he was made a flight surgeon. His assignments during four years in service included twenty-eight months in Europe, with duty in England, France, Belgium, Holland, Luxembourg, Germany, Austria and Switzerland.

At the expiration of his terminal leave on February 15, 1946, Dr. Eberley enrolled at the University for a six months' postgraduate course. Recently he had been practicing in association with Dr. James J. Warner at Perham.

* * *

Eight oil paintings which included Rochester scenes and California landscapes, the work of Dr. John E. Crewe, were exhibited in a downtown Rochester store during the first week of January.

Dr. Crewe, who is seventy-four and has been in medicine for half a century, started painting as a hobby about fourteen years ago, but he has never had any instruction. Most of the work has been done during the past few years when his health was such that he had to take things easier.

In all, Dr. Crewe has completed about twenty paintings, some of them in water color, his first media. The work is notable for a fine sense of color. Except for a showing of a few paintings at a physician's hobby show, this is the first time Dr. Crewe has exhibited his work.

* * *

Effective January 1, 1947, Dr. Luverne H. Domeier, formerly of Sleepy Eye, began practicing at New Ulm in association with Dr. Otto J. Seifert, whom he had been assisting for the past several months.

Dr. Domeier is a graduate of St. Thomas College, Saint Paul, and took his medical degree at Loyola University, Chicago, in 1939. Following the completion of his internship at St. Joseph's Hospital in Saint Paul, he took postgraduate work at Wayne University, Detroit, Michigan, where he was granted a fellowship in the Department of Pathology in 1940. He has also been pathologist in hospitals in Pontiac and an instructor at Wayne. His army service includes three years as director of laboratories and internal medicine in hospitals in Florida. At the time of his discharge, Dr. Domeier was a major.

* * *

After an absence of five years, Dr. Charles Vanderluis has resumed his practice at Bemidji. Dr. Vanderluis is a graduate of the University of Minnesota Medical School and interned at the city hospitals in Baltimore and St. Louis. He entered practice at Bemidji in

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Two weeks Surgical Pathology every two weeks.

GYNECOLOGY—Two-week intensive course starting March 17, and April 14.

One-week course in Vaginal Approach to Pelvic Surgery starting March 10 and April 7.

OBSTETRICS—Two-week intensive course starting March 3 and April 28.

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OF GENERAL INTEREST

1935 and for the four years immediately preceding his entry into military service in 1942 was coroner of Beltrami County.

Dr. Vandersluis' military assignments included nineteen months in New Guinea and the Philippines. He was returned to this country for separation from service in November, 1945. For the past year he has been engaged in postgraduate work at the University of Minnesota—six months' study in pathology and six months in disease of the heart and blood cells. Dr. Vandersluis is limiting his practice to internal medicine.

During the doctor's absence from Bemidji, Mrs. Vandersluis and their two children remained at home there.

* * *

Dr. Frank W. Quattlebaum and Dr. Jane E. Hodgson have opened offices at 511-512 Lowry Medical Arts Building, Saint Paul, for the practice of surgery, gynecology and obstetrics.

Dr. Quattlebaum is a graduate of the University of Georgia School of Medicine, Class of '39. His internship and an assistant residency at the Medical Center, Jersey City, New Jersey, were followed by a fellowship in obstetrics and gynecology at the Mayo Clinic.

Dr. Hodgson took her medical degree at the University of Minnesota in 1939 and also served her internship and an assistant residency at the Jersey City Medical Center. While there she was married to Dr. Quattlebaum.

For the past year and a half Dr. Hodgson has been practicing at New Smyrna Beach, Florida, and Dr. Quattlebaum was stationed with the Army Medical Corps at Daytona Beach, nearby.

* * *

New and expanding plans for the Mayo Memorial on the University of Minnesota campus now under consideration call for a 19-story structure which would include a new cancer research institute, a wing for the University's School of Public Health, medical administrative offices, an addition to the University Hospitals, a medical and biological library and a large auditorium.

The estimated cost of the Memorial under the original plans was \$2,000,000, of which the legislature had appropriated \$75,000 and the rest was to be raised by private subscription. If the new plans are adopted, considerably more money must be raised, and the Founder's Committee is studying possible new sources. Among them are a Federal grant, and another appro-

priation from the Minnesota Legislature. The Minnesota Cancer Society is considering a separate campaign to raise the necessary funds for the Cancer Institute.

Dr. Donald J. Cowling, Saint Paul, is chairman of the committee, and Dr. George S. Earle, Saint Paul, is secretary.

* * *

Dr. Henry W. Meyerding, of Rochester, has returned from a European trip during which he attended a number of medical meetings and gave several addresses. While in Amsterdam, Dr. Meyerding addressed the Society for Furtherance of Physics, Medicine and Surgery, which was established in 1820 and is the oldest medical society in Holland. He was introduced to the gathering by Dr. Peter Formijne, general president of the society, who was a graduate student in medicine at the Mayo Foundation in 1929 and 1930.

In Paris Dr. Meyerding attended the Congress Francaise de Chirurgie, and was elected an honorary member in the Academie de Chirurgie Francaise, which recently celebrated its one hundredth anniversary. He also spoke at a meeting of the Societe Francaise d'Orthopedic and was elected to honorary membership in this organization.

While in Brussels Dr. Meyerding attended the International Society of Orthopedic Surgery and Traumatology as delegate for the United States, and presented a paper on the "Surgical Treatment of Malignant Tumors of the Bone." He was honored by being elected president of the next Congress of the Society, which will be held in Amsterdam in the fall of 1948.

Dr. Meyerding also assisted at the dedication of a

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* * *

Among those receiving their medical degrees at the December commencement at the University of Minnesota were: Dr. Melvin Reeves, of Brainerd; Dr. William H. Ryan, of Little Falls; Dr. James H. Kelley, of St. Paul; Drs. John Watson, Peter Habein, Charles Conley and Mark Anderson, Jr., all of Rochester.

Dr. Ryan is serving his internship at the Alameda County Hospital in Oakland, California, and will be there until June.

Dr. Reeves, who has been at the Sheltering Arms Hospital in Minneapolis, serving a junior internship for the past year, will take his senior internship at the Good Samaritan Hospital in Portland, Oregon, and St. Barnabas Hospital in Minneapolis.

Dr. Watson will intern at the Robert Packer Hospital in Sayer, Pennsylvania.

Dr. Habein, who is the son of Dr. Harold C. Habein, Rochester, has accompanied his mother to Tucson, Arizona, where they will spend the winter.

Dr. Anderson, son of Dr. Mark J. Anderson, has gone to California with his parents and will serve his internship at the Orange County Hospital in Los Angeles.

* * *

Twenty-one Rochester physicians were awarded degrees for work done at the Mayo Foundation at the December Commencement of the University of Minnesota, and ten physicians received degrees, in absentia, for work performed in the various fields of the Foundation.

M.S. degrees in surgery were conferred on Drs. John A. Evert, Ellis E. Fair, Robert F. Golden, Chester L. Holmes, Charles S. Joss, Cecil G. McEachern, Wendell L. Nielsen, John H. Remington, F. H. Smith and John Zaslow.

Drs. David T. Carr, Edgar A. Haunz, Mary C. Long, Allan E. Moe and Irwin M. Vigran, received M.S. degrees in medicine.

Dr. John R. Hodgson received an M.S. degree in radiology; Dr. J. J. Hinchey, in orthopedic surgery; Dr. John T. Robson, in neurology and psychiatry; Dr. J. W. Pender and Dr. William N. Hardman, in anesthesiology, and Dr. W. S. Green, in dermatology and syphilology.

Those who received the degrees in absentia were Dr. Brown M. Dobyns, Ph.D. in surgery; Drs. A. F. Castrow, Leonard C. Hallendorf, Jack A. Killins, Henry R. Thomas, M.S. in surgery; Drs. Natalie M. Briggs,

Richard N. Kent, Paul V. Morton, and A. S. Mann, M.S. in medicine; and Dr. L. Williams, M.S. in neurosurgery.

* * *

ERRATUM

Attention is called to an error which occurred in the Slyd-Rul sent to physicians recently by Ciba Pharmaceutical Products, Inc., on which the conversion of 0.49 grains reads 0.25 grams when it should read 0.025 grams. Slyd-Ruls with this error corrected will be sent in replacement as soon as possible.

* * *

HOSPITAL NEWS

Staff members and associate members of St. Joseph's Hospital, Mankato, held their annual banquet and election of officers at the hospital on December 12.

All the incumbent officers retained their positions for the ensuing year by unanimous vote. They are: president, Dr. H. Bradley Troost; vice president, Marshall I. Howard; secretary-treasurer, Dr. Anthony A. Schmitz. The members of the executive committee are Dr. Alphonse E. Sohmer, chairman; Dr. Roger G. Hassett and Dr. George E. Penn.

* * *

Dr. Viktor O. Wilson, Division of Child Hygiene, State Department of Health, in collaboration with an advisory committee of twenty-three members appointed by former Governor Thye, is taking an inventory of existing hospitals and making a study of the total hospital needs for the state. The survey is being made in order to qualify for a share of the \$75,000,000 annual appropriation for construction of hospitals which is expected to be authorized by Act of Congress.

* * *

The management of the More Hospital at Eveleth has announced the addition of two members to the staff. They are Drs. Carleton W. Leverenz and Lloyd H. Klefstad, both veterans of World War II.

Dr. Leverenz, who is a graduate of the University of Illinois Medical School, interned at Ancker Hospital in Saint Paul. He served in the Army Medical Corps for five years and was in Japan when the war ended.

Dr. Klefstad, a native of Duluth where he grew up, took his medical degree at Western Reserve University, Cleveland, Ohio. He was in the U. S. Navy for three years, his assignments taking him practically around the world.

* * *

Dr. L. Kenneth Onsgard, who recently joined the staff of Grandview Hospital in La Crosse, Wisconsin, is still practicing at Houston, where he makes his home.

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BOOK REVIEWS

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

CHECK and DOUBLE CHECK on SICKNESS INSURANCE. I. Weston Walch. Price 25 cents; Special prices in quantity. New York: Public Relations Bureau, Medical Society of the State of New York (292 Madison Avenue, New York 17, N. Y.), 1946.

"Check and Double Check on Sickness Insurance" is a new pamphlet published December 15 by the Public Relations Bureau of the Medical Society of the State of New York. The subject is covered in 133 questions and answers with a complete index. By use of this index any speaker or writer can find, in a few minutes' time, material for a 15-minute talk or an editorial a column in length.

The author, J. Weston Walch, is instructor in Economics and Business Law, Portland (Maine) High School, and manager of the Platform News Publishing Company. He studied the subject of sickness insurance while preparing a handbook for use by participants in nation-wide high school debates. Here he gives what he thinks are the outstanding points in the controversy, from the standpoint of a plain American citizen, just as they impressed him in the course of his own work on the handbook.

Mr. Walch was asked to do the job because this question will ultimately be decided in the forum of public opinion. He is thinking here of what would happen to him under compulsory sickness insurance. As an average citizen, he doesn't like it. Legislators already know the doctors don't like it. Here is the evidence that the J. Weston Walches of the country don't like it, either. The last question propounded by the booklet is, "Mr. Walch, in your study of this subject what point strikes you most forcibly?" The author answers as follows:

"I am most interested in my own health and well-being and that of my family. I have tried to examine every important point on the subject of sickness insurance on the basis of how I thought my own interests would be affected. I feel that there are other ways of improving the medical care of the American people without resorting to government compulsion.

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CHILDREN IN THE COMMUNITY. The Saint Paul Experiment in Child Welfare. U. S. Children's Bureau, Social Security Administration, Federal Security Agency, Washington, D. C.: Children's Bureau, 1946. Free upon request.

An experiment that has challenging implications for communities in dealing with boys and girls with behavior problems is described in this recent publication of the U. S. Children's Bureau. It tells of the work done and the results obtained in Saint Paul, Minnesota, in bringing all community resources to bear in a "first aid" program for youth in trouble.

This experimental project, which was initiated by the Bureau and developed with the co-operation of social agencies in Saint Paul, and carried on from 1937 to 1943, was confined to a neighborhood of 20,000 persons. The neighborhood was small enough for study purposes and yet large enough to provide a good cross-section of a metropolitan community. It represented a wide range of nationality and of family income. The children involved were typical of those to be found anywhere, their behavior problems presenting the usual run of truancy, pilfering, school failure, inability to get along with other children, and the like.

The idea back of the Children's Bureau undertaking was to see what might be done "early in the game" to get a child and his family the help the community had to offer. The schools, the churches, and youth organizations, such as Boy and Girl Scouts and the like, were involved. So were social and law-enforcement agencies, and the community's health services. All were drawn into a plan which called for their referring to the proj-

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ect—The Community Service for Children—boys and girls they knew to be in trouble of one kind or another.

Altogether some 700 children were given individual assistance. For some the project's role was largely that of referring the parents or the teachers or some other interested person to a place or person who could help. The referral, in most such cases, followed upon a diagnosis by the project. But, for some 400 boys and girls much more was done and in many cases over a long and difficult period. In four out of five cases, an improvement was brought about and in a high proportion, almost 70 per cent, a change for the better was made in the situation causing, or affecting, the child's behavior, thus giving promise of a long-run improvement. Significantly, although the juvenile delinquency rate for the city rose, in the section in which the project was operating a decline took place.

The value of the project, the Children's Bureau reports, lies in the fact that nothing was done in St. Paul that could not be done in other communities. Those directing the project simply went into the community to try to make a better use of what was at hand in the way of services for children. What developed that was new was the setting up of a referral center to serve as a "first-aid station," as it were, for boys and girls in trouble. Any community, the Bureau points out, could bring about such a co-ordination of its services for children. In small communities, it adds, the child welfare worker or some other person in a strategic position might well serve as the co-ordinator.

Lacking such a central place, or person, informed about all community resources, those dealing with the youngsters—parents, teachers, clergymen, welfare officials, court officials and police officers—are thrown back upon their own resources. They often do not know how to go about seeking help. The Saint Paul project showed how they could get help, and, as a result, many children were benefited.

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(Continued from Page 175)

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MOBILE SPEECH CLINIC UNDERTAKES SURVEY

(Continued from Page 189)

patient again, there is no need for further consultation. So after the prescribed medicine is gone, the infected ear is ignored until the child's hearing is impaired; or parents who were advised to "give your child time" to learn to talk give him years while his disability grows more and more impervious to treatment.

But University and Minnesota Association officials are convinced that public education can alert the general population to the vital necessity for early diagnosis and correction of such handicaps. And that, in the long run, is exactly what the Mobile Speech Clinic hopes to accomplish.

BOMBAY TO BROOKLYN

Nature's medicine chest is a worldwide reservoir. From Bombay to warehouses in Brooklyn come the hard, bitter seeds of the nux vomica tree, used as a stimulant and general tonic. The fruits are collected in India by tribal natives, who clean, dry and sort the nux vomica seeds in crude trays before shipment.

Ipecac, the dried roots of the ipecacuanha, a low struggling shrub with emetic and expectorant properties, comes from the moist, woody areas of Brazil, Bolivia and Colombia.

Thyme, the aromatic herb, dots the fields of Italy, France and Spain. Its leaves and flowertops produce a soothing oil used in some proprietary medicines in connection with bronchitis and whooping cough.

The Alps, Pyrenees and Vosges of Europe are speckled with the greenish-white flowers of sweet-smelling angelica and the yellow gentian, or felwort. The seed of the former becomes a carminative and tonic. The gentian root, pulled up in summertime and heaped on the ground to ferment, is a bitter tonic. Also flourishing in these mountains is the poisonous monkshood, prescribed under the name of aconite for fevers and heart conditions.

Purgative plants have similar backgrounds. Senna, a constituent of some laxative preparations, is the sun-dried leaflets of a flowering yellow shrub, knee high, which thrives on the heat of the Nile Valley as well as in India. Arabian senna leaves are picked twice a year, crammed into large palm leaf sacks and transported across the desert by camel back to the market places of Port Sudan and Alexandria.

Aloe, a cathartic whose succulent pale green leaves are snipped open and drained into kettles to produce a dried juice, is shipped in gourd shells from Socotra Island, Africa, and from Curacao.

Jalap, the potent purgative, is the dried, tuberous root of a plant grown 6,000 feet above sea level near the city of Jalapa in Vera Cruz. The roots, having been dried out over the hearths of native Indian huts, have a distinct smoky taste.

Agar-agar, a bulk-producing agent as well as a bacteria culture medium in research laboratories, is cultivated by Japanese deep-sea divers fathoms beneath the ocean surface. This peculiar seaweed produces a mucilaginous substance which is carried up into the dry-cold air of the Japanese mountains to be dehydrated and extruded into long, flat strands.

Frangula, the bark of the European buckthorn shrub, irritant psyllium seeds from the Mediterranean and cassia pulp of the pods from the puddingpipe tree in the East Indies are among other laxative herbs from distant sources.

Cloves, a good mixer with drugs, is a spice made of the dried flower buds of the evergreen clove tree in the Philippines and Molucca Islands. In Zanzibar, natives secure the pungent buds by thrashing the trees with bamboo rods. The cloves are spread out on mats to dry in the sun before being baled for export.

Many of these roots, leaves, seeds and flowers are also used in flavoring foods, as condiments, and in perfumes. Aromatic myrrh, for instance, the sweet-scented gum drawn from myrrh trees in Somaliland, has triple duty: as a flavoring extract, as a perfume and as an antiseptic in dentifrices and mouth washes.—O.P.I. Bulletin, August, 1946.

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MISCELLANEOUS

Epithelial Neoplasms of the Appendix

(Continued from Page 178)

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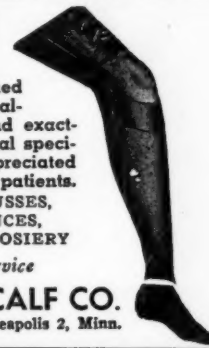
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Rachitic changes were present as late as the fourteenth year, and the incidence was higher among children dying from acute disease than in those dying of chronic disease.

The authors conclude, "We doubt if slight degrees of rickets, such as we found in many of our children, interfere with health and development, but our studies as a whole afford reason to prolong administration of vitamin D to the age limit of our study, the fourteenth year, and especially indicate the necessity to suspect and to take the necessary measures to guard against rickets in sick children."

*R. H. Follis, D. Jackson, M. M. Eliot, and E. A. Park: Prevalence of rickets in children between two and fourteen years of age, *Am. J. Dis. Child.* 66:1-11, July 1943.

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